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Original Articles

A STUDY OF TWO UNUSUAL BRAIN TUMORS; ONE A
MULTIPLE CYLINDROMA OF THE BASE OF THE BRAIN,
THE OTHER A NEURO-EPITHELIOMA OF THE CHOROID
PLEXUS OF THE FOURTH VENTRICLE.*

BY HERMON C. GORDINIER, A.M., M.D.,

OF TROY, N. Y.,

PROFESSOR OF PHYSIOLOGY AND ANATOMY OF THE NERVOUS SYSTEM IN THE
ALBANY MEDICAL COLLEGE; PHYSICIAN TO THE SAMARITAN HOSPITAL;

AND H. W. CAREY, A.B., M.D.,

OF TROY, N. Y.,

INSTRUCTOR IN SURGICAL PATHOLOGY, THE ALBANY MEDICAL COLLEGE, AND
PATHOLOGIST TO THE SAMARITAN HOSPITAL.

Case I.—Multiple cylindroma of the base of the brain, involving the second, third, fourth and eighth cranial nerves, and producing symptoms closely simulating a tumor of the quadrigeminal bodies.

December 1, 1903. Saw in consultation Mr. C., aged forty-nine years, married, laborer by occupation. His chief complaints were severe continuous headache, dizziness, difficulty in walking, deafness, and failing vision.

Family History. Father died of heart disease, mother of cholera. He had lost nine children, six in infancy, two of smallpox, and one was accidentally killed. No insanity or nervous diseases in family. Previous history negative.

Present illness began in the early part of June, 1903, with dizziness and severe dull headache, confined chiefly to the right side. A short time after the patient noticed peculiar hollow sounds and noises in each ear as if steam were escaping or gongs were ringing. In July, 1903, discovered that he was becoming deaf in the right ear. Three weeks later hearing

* Read at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.

was lost in the left ear. In the early autumn his gait became unsteady and he swayed from side to side like a drunken man.

Examination. The patient is a tall, slightly built man with flabby musculature and considerably emaciated. The temporal and radial arteries are thickened. The apex beat is slightly displaced downward and outward and the aortic second sound is accentuated. There are no adventitious sounds. The cardiac dulness is entirely effaced and the upper line of liver dulness diminished by a vesiculo-tympanic note. The lungs are normal except for a moderate degree of emphysema. The urine is negative.

Nervous System. Cranial Nerves. The pupils are unequally dilated, the left being the larger. They respond very sluggishly to light and accommodation. The eyeballs are held in a position of moderate divergence, the only movement of the globes permissible being in a slightly upward direction. Ptosis is present on both sides, being most marked on the left. The patient is able to distinguish and name objects accurately, recognizes colors, but is unable to read moderately coarse print. Optic neuritis exists, more accentuated in the left eye.

The facial muscles present no tremor, atrophy or asymmetrical action. The tongue is protruded straight and is normal in size and appearance. The palatal and pharyngeal muscles functionate normally.

No anesthesia or analgesia of either side of face; no rigidity of neck muscles. Smell and taste are normal. The vocal bands move in a normal manner.

The patient is unable to hear either a loud ticking watch or a tuning fork, when held close to the ears. The bone conduction is greatly and equally diminished on each side. The left drum membrane was normal. The right auditory canal was so occluded by a plug of old wax that it was impossible to view the drum.

Reflexes. Patellar reflexes are lively; no patellar or ankle clonus. No Babinski sign. The Achilles tendon reflex is normal on each side; no Kernig sign. Tendon reflexes of the upper extremities absent, all superficial reflexes normal.

Sensation was very carefully tested and found normal.

There is no loss of stereognosis. No loss of muscular sense. Motor power normal, muscles wasted only from disuse.

The patient's gait is typically cerebellar in type, he is unable to walk without assistance and sways from side to side as he progresses, his feet being widely separated so as to broaden his base of support.

His memory is gradually failing both for past and recent events, his cerebration is slow. No aphasia exists.

The general symptoms in this case, i.e., severe headache, :

dizziness and double optic neuritis clearly pointed to an intracranial lesion, probably a new growth, while the order of appearance of the focal symptoms, i.e., almost complete deafness, preceded by bilateral auditory hallucinations of peculiar sounds, as if steam was escaping or gongs ringing and followed

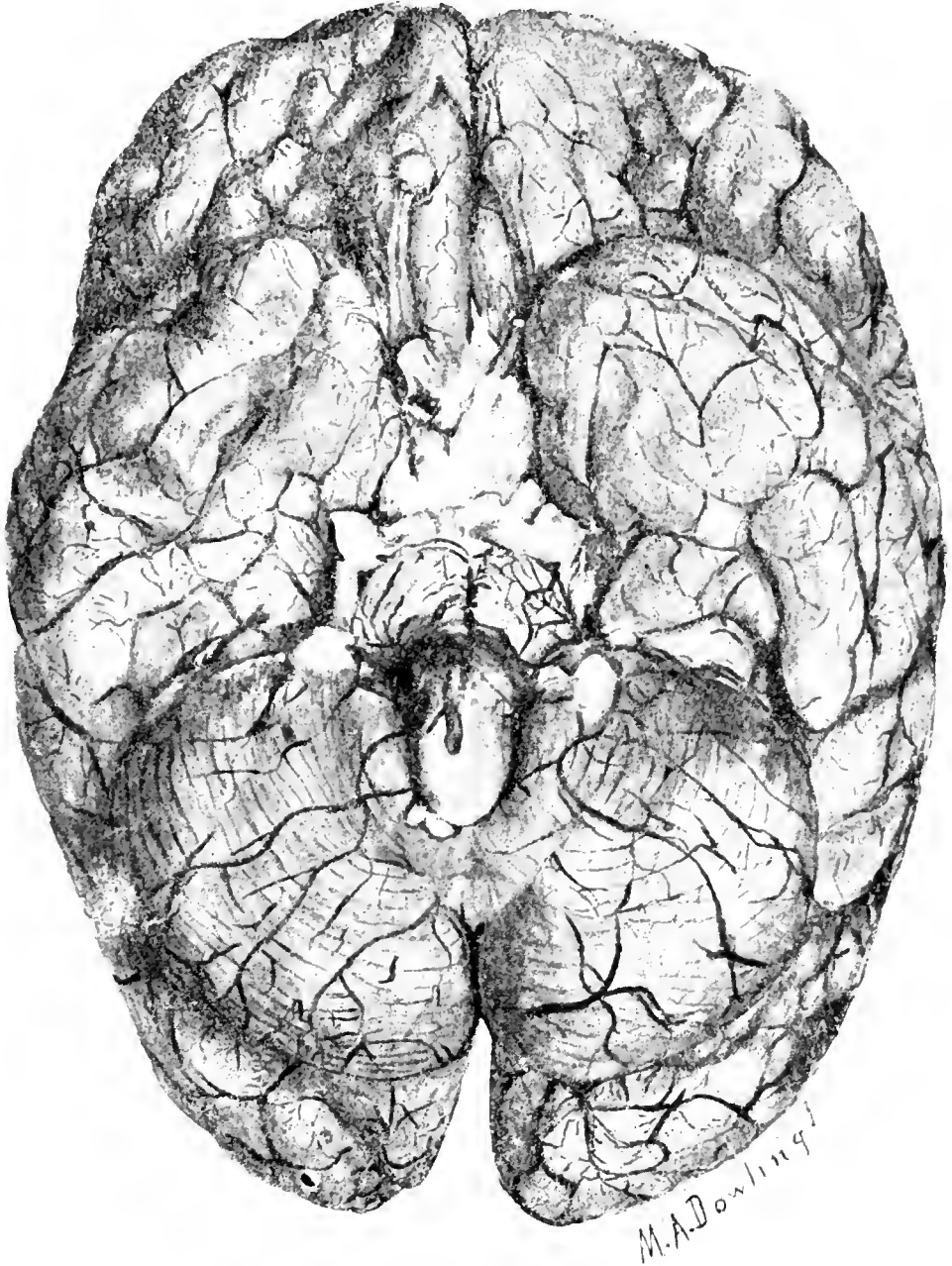


FIG. 1. Base of the brain, showing the appearance and distribution of the perithelial tumors.

by a typical cerebellar gait, and almost complete ophthalmoplegia externa and interna, seemed in our judgment to place the primary position of the lesion in the region of the dorsal quadrigeminal bodies. The central gray matter situated about the aqueduct of Sylvius was thought to have become involved

secondarily, by a ventral extension of the growth, thus destroying the nuclei of origin of the third and fourth cranial nerves and causing the ophthalmoplegia.

The auditory auræ and deafness and the incoordination seemed equally well explained by this localization of the lesion. The former being due to an irritation with destruction of the central auditory tracts, "lateral fillets," the latter either to compression of the central part of the median worm or the ventral cerebellar peduncles. The patient was placed on large doses of potassium iodide together with mercurial inunctions with the hope that the lesion might be gummatous in nature. He was seen again on January 15, 1904, after six weeks of continuous mixed treatment. He was confined to bed unimproved, in fact all symptoms were much worse. The incoordination was so extreme that he was unable to stand or to take a step. He died two weeks later of exhaustion.

Autopsy—Dr. Gordinier. No abnormality in the cranial bones. The membranes were normal. Sinuses and surface veins not obstructed. No increase of cerebro-spinal fluid. The brain was hardened in toto and later sectioned. On the base of the brain multiple tumor formation was noted, the tumors were distributed as follows. One tumor 0.5 cm. in diameter on each olfactory bulb, one tumor 3.0 x 2.5 cm. in the interpeduncular space, inclosing the optic nerves, optic commissure and third and fourth nerves; four small tumors on the internal surface of the temporo-sphenoidal lobe varying from 0.2-0.5 cm. in diameter, two tumors 0.5 cm. in diameter on the anterior surface of the pons, one tumor on the base of the right lobe of the cerebellum. At each cerebello-pontine angle exists one of these tumors encircling and compressing each auditory nerve close to its point of connection with the pons. Isolated tumor masses of the same material were also found infiltrating each auditory nerve at its exit from the internal auditory meatus. On section, one tumor 0.4 cm. in diameter on the internal aspect of the left frontal lobe and two tumors symmetrically placed in the angle between the caudate nuclei and corpus callosum in the lateral ventricles, 0.5-0.2 cm. in diameter. From the above it is seen that the tumors presented no symmetry in arrangement. The size varied within wide limits, the smaller tumors representing more recent growths, the largest one in the interpeduncular space being in all probability the first one to develop. Macroscopically it is seen that the smaller tumors are attached to the visceral layer of the pia mater and are removed with it when it is stripped off. The larger tumors do not show so distinctly this attachment to the pia mater and are frequently found infiltrating the cortex. The tumors were grayish in color and had the consistency and appearance of soft cartilage.

Microscopically the tumors appear to be composed of aggregations of minute globules of opalescent hyalin-like refractive material. So far as can be seen there is no stroma whatever.

Teased preparations from the fresh tumor showed mostly globules, less often strings of homogeneous hyaline-like material in the center of which are cells. The larger masses are made up of aggregations of these globules. The basement substance occasionally shows striations or fibrillæ. Several of the tumors were excised and some were prepared according to the Weigert-Pal method to determine the extent of the degenerative changes in the basal nerves and cortex, others were imbedded in paraffin and stained in a variety of ways for histological study.

Microscopically the basement substance greatly exceeds the cellular elements. In the small growths the pia mater is extending over the growths at the margins and presents here a fairly normal appearance. The endothelial cells are, however, slightly swollen; over the central or basal portion no trace of the pia is seen. The portions of the tumors bordering the pia show the greatest amount of basement substance, cellular elements are rarely seen.

The cells are most numerous in the portions bordering the cortex. They are placed in cavities of the basement substance either singly or in groups, and are surrounded by a wide meshed reticular substance. No definite boundary divides one cell from another, they form rather irregular masses of multinucleated protoplasm often vacuolated or containing droplets of fluid.

The nuclei are of variable size, some being as small as a red blood corpuscle, others several times larger, the smaller ones taking a deep hematoxylin stain, the larger ones showing a more reticulated structure. The matrix with the cells have the appearance of syncytium. The presence of droplets in the cells, makes it probable that the basement substance is derived from them. At some distance from the syncytial masses the basement substance becomes denser and has a homogeneous appearance like that of hyaline cartilage. To determine the character of the basement substance, sections were stained with thionin and with polychrome methylene blue. The looser portions bordering the cells take a distinct reddish tint characteristic of mucus, the denser portions are bluish red like the hyalin of cartilage.

With the iodine test no glycogen could be found in the cells. In some portions of the tumors the appearance of the single cells in lacunæ, surrounded by hyaline basement substance bears a close resemblance to hyaline cartilage and has been so interpreted by Meckel, Boettcher and others, but in

these tumors the growth is essentially a proliferation of perithelial cells which secrete the basement substance. While endothelial or perithelial cells are primarily of mesoblastic origin and closely related to connective tissue, they represent a differentiated form, and not true connective tissue. There is no connective tissue in the tumor, from which this hyaline could be formed, so in spite of its close resemblance to cartilage we do not look upon it as such.

The method of growth is seen clearly at the periphery of the tumor in the cortex. The syncytial masses here are in the form of long narrow strings and frequently in the center of these there is a double row of flat endothelial cells, often with a lumen



FIG. 2. Case I. Perithelioma, showing the mode of extension by capillary growth into the cerebral cortex.

containing red blood corpuscles. The tumor cells are on either side of these capillaries and even at this early stage and while actively growing, show vacuoles, and droplets of fluid, and are surrounded by mucus. The basement substance here is probably therefore a secretion from the tumor cells.

As the perivascular cells proliferate and throw out their secretion, the capillary is compressed and finally obliterated. Fully developed blood vessels are rarely seen and when present do not form a part of the tumor, but are cerebral or pial vessels.

The tumor therefore is primarily a perithelioma, springing from the perithelial cells in the walls of the blood capillar-

ies and rapidly undergoing hyaline metamorphosis. To such tumors of endothelial origin with extensive hyaline changes and the formation of hyaline balls and cylinders Billoth has given the name of cylindroma. This tumor then is a hæmangio-perithelioma cylindromatosum.

Sections of the growth in the interpeduncular space stained by the Weigert-Pal method show that the tumor has invaded the optic commissure, the optic, third and fourth nerves and has caused extensive degeneration in them as well as in the basal cortex.

In seeking the point of origin of these tumors it may be said that in none of the sections could any connection between the tumor and the pia be traced. At the margins of the tumors, the pia shows only a slight reactive swelling, and over the central portions it has undergone atrophy probably from pressure. The growths are located between the pia mater and the cerebral cortex and in origin are independent of both.

Inasmuch as they cannot be traced to any of the fixed tissue elements they probably originated from cells included in the brain in its early development.

As to the nature of the cells inclosed, their immediate development into capillaries suggests that they were destined to form such structures in the ordinary course of their development, that is vaso-formative cells. The multiplicity of the tumors favors this mode of origin, for the numerous growths are not the result of metastases, but are distinct from each other in their development. Their location on the base of the brain near the line of closure of the cerebral vesicle, and the growth of the cells in the form of syncytium, is also in favor of their development from inclosed germinal cells.

The malignancy of the tumors is not marked, for although there is a tendency to invade the cortex as described in the optic chiasm, optic, third, fourth and auditory nerves, the invasive power is diminished by the lack of proper vascular supply.

Multiple endothelial tumors of the brain are not infrequent, but such an advanced grade of hyaline degeneration so far as can be determined, has not been hitherto described.

Multiple cylindroma of the spinal cord have been observed however by Glaser and by Ganguillet and in appearance closely resembles this tumor. A thorough search of the references on this point however is almost impossible on account of the varied nomenclature applied to this form of tumor.

In conclusion we beg to call your attention to the fact that the peculiar distribution of the tumors anatomically, produced a symptom-complex highly suggestive of, and by Nothnagel attributed to, a lesion of the quadrigeminal bodies.

Case II.—A Neuro-epithelioma of the choroid plexus of the

fourth ventricle, growing dorsally and producing symptoms characteristic of a tumor of the median lobe of the cerebellum.

December 30, 1898. W. K., aged ten years, German. Father living and well. Mother died of some stomach trouble, probably cancer. Has had measles, varicella, mumps and pertussis. No history of any nervous disease or insanity in family. Never received an injury to his head.

Present illness began about November 1, 1898, with the symptoms of la grippe, and severe occipital headache. Later the headache became general. He tired easily, and would have frequent and very severe dizzy spells: In December he left school, because of the severe headache and his inability to remember his lessons. Soon after, his gait became so affected that in order to walk he would have to support himself by pushing forward a chair.

Present Condition. Pupils dilated, equal, and respond but slightly to light and accommodation. Excursion of eyeballs normal. Slight lateral nystagmus. Double optic neuritis. No hemianopsia. Hearing normal in left ear, but is reduced in the right, because of a chronic otitis media.

Examination of eyes by Dr. F. A. Smith; Right eye, V-20-50, pupil large, 9 m.m. in diameter; reacts to light and accommodation; media clear; disc swollen 3 D, outline not discernible; veins enlarged; arteries normal; field of vision slightly diminished on temporal side. Left eye, V-20-90; pupils large, 9 m.m. in diameter, disc swollen 3 D; field of vision normal. The internal ocular muscles of both eyes are normal.

No facial asymmetry. Tongue protrudes straight. Sense of taste and smell normal. Vocal cords move normally. Patient sways to the right side when he stands or attempts to walk. This is very marked when he walks backward. Romberg's symptom not marked. Movements of upper extremities a little awkward, but otherwise normal. Sensation is everywhere normal.

Reflexes—Right patellar reflex slightly exaggerated. Left normal. No ankle-clonus. Superficial reflexes of both sides preserved and normal.

Heart, lungs and urine normal.

February 1, 1899. Patient's condition is very much worse. Headaches very severe. There is rigidity of the neck and upper part of the spine. Scalp is very tender, over occipital and parietal regions, and on percussion, there is distinct tympanic note over both parietal bones. A few days ago, he had a dizzy spell, staggered forward, seemed dazed and said he could not see. During this attack the pupils became widely dilated, and there was an evanescent loss of consciousness. When he awakened, he was in a bewildered state and fre-

quently asked where he was. He complains, also, that his feet are icy cold most of the time.

March 1, 1899. His breathing is irregular and labored. Has frequent attacks of hiccough and some difficulty in swallowing. Pulse is rapid and feeble. Died, March 7, 1899, at 7 a.m.

Autopsy at 8.30 p. m. Pupils equal and widely dilated. Eye-balls slightly divergent. Glabella to occipital protuberance, 35.5 c.m.; circumference at zygomatic processes, 58 c.m.

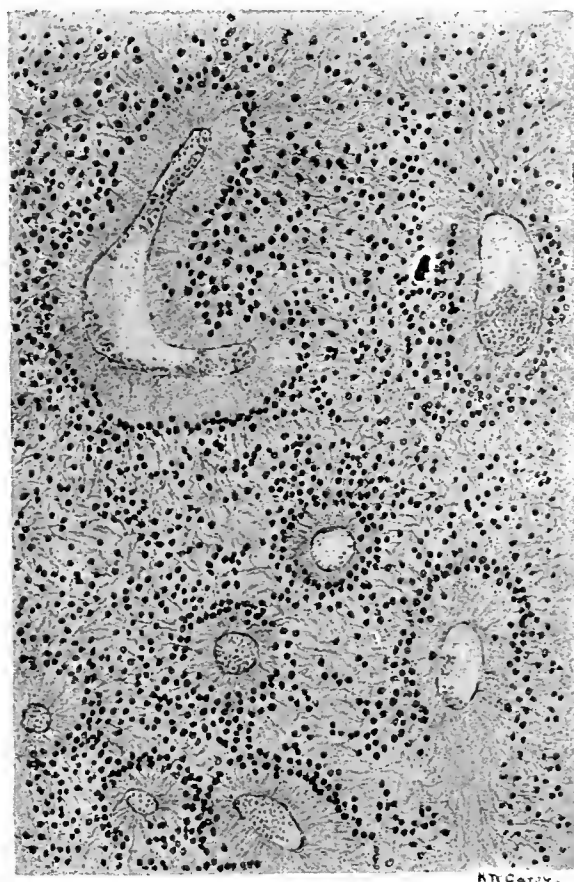


FIG. 3. Case II. Shows the rosette formation and neuroglia tissue between.

Skull cap, over lower temporal regions is very thin. In a few places over the vertex, it is as thin as paper. Vessels of pia distended. Convulsions flattened. Dura thinned, not adherent and normal. There is a very great increase of the subarachnoid fluid and the lateral and third ventricles are distended. The nerves at the base are perfectly free, and normal in appearance. The oblongata is pushed forward. On section, through the median lobe of the cerebellum, a tumor was discovered irregularly quadrilateral in shape, measured 3.5 c.m. anteroposteriorly, and 2.75 c.m. transversely. This tumor

was very vascular and was located in the fourth ventricle, almost completely filling it. It took its origin from the choroid plexus. In its growth forward and upward, it pushed itself through the velum medullare posterior, compressed and grew into the inferior worm of the cerebellum. Upon examination of the tumor microscopically, under low magnification, three fairly distinct elements can be distinguished: tumor cells, fibers and blood vessels. A description of each element will be given first, then their relationship to one another.

The tumor cells are of two kinds although there are many gradations between. One cell form (type A) is of small size with oval or round deeply staining nuclei and only a small rim of protoplasm around them. They closely resemble lymphocytes in size and appearance.

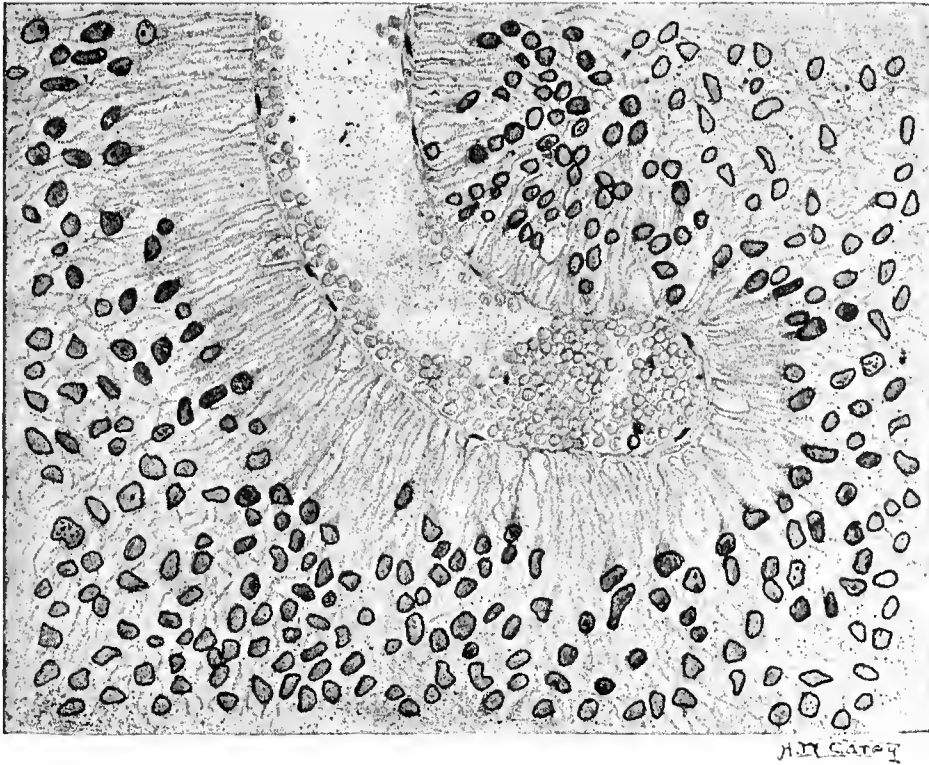
The second cell form (type B) closely resembles glia cells, they show a varied cell outline, a generous amount of protoplasm with numerous processes or fibrils extending outward, sometimes only from the poles, sometimes from the whole periphery. The fibrils when single are very thin and delicate, they often coalesce to form thicker cords. Most of the fibrils are attached to the cell body but some are free. They form a network in which the cells are placed. The blood vessels are numerous at the periphery of the tumor, their walls have undergone hyaline degeneration, in the central portions, the capillaries are very numerous and give a plexiform appearance to the tumor.

The tumor is attached to the median lobe of the cerebellum above, but the cerebellar tissue takes no part in the growth and appears compressed, but is otherwise normal.

The ependymal cells lining the inferior surface of the velum are normal in appearance, except where they approach the attachment of the tumor, here they are flattened and are reflected over the outer surface of the tumor for short distance and then merge gradually into the tumor cells of type A. At the periphery and near the base of the tumor, the cells are almost exclusively of type A. They often arrange themselves in groups of eight or ten cells with nuclei peripheral and protoplasm central, no lumen, however, is seen. Structures similar to these are seen in ependymitis granulosa. This portion of the growth is very cellular, few fibers are present. Toward the center the blood vessels become more numerous although smaller in size and are surrounded with a mantle of cells with a band of fibers, radially arranged, intervening. The cells are in several layers about the vessels with nuclei toward the periphery.

The fibers originate from these cells and extend inward toward the capillary, are closely placed and frequently unite before reaching the vessel wall. From the periphery, fibers

also extend and form part of the general network of fibers. The central vessels with the radiating fibers and surrounding mantle of cells, form characteristic structures, which are termed rosettes. Between the rosettes, which form the main mass of the tumor, are cells of both types and all gradations between them. There are some areas which begin with a hyaline degeneration of the vessel wall, then hyaline masses are found in the spaces between the fibers immediately surrounding the blood vessel. Eventually the whole rosette undergoes hyaline degeneration.



Case 2. Muthmann. Ziegler's Beiträge, 1903, No. 34, p. 445.

FIG. 4. Case II. Rosette; high magnification.

Origin. From these facts we feel justified in assuming that this tumor sprang from the ependymal cells of the choroid plexus of the fourth ventricle. Whether the growth began primarily in the ependyma or in the blood vessels we can not determine, but the epithelial structures form the main mass of the tumor and are the essential element of its growth. The gradual change of the ependymal cells into glia cells we interpret as a metamorphosis into their embryonic form, a metaplasia.

This form of tumor has been named neuro-epithelioma by Flexner who first described a tumor of somewhat similar structure to this one in 1891, which had its origin in the exter-

nal nuclear layer of the retina. They have also been termed ependymal glioma, but as Flexner pointed out in his original communication, this is improper in that the growth originates from the epithelium and not from neuroglia.

Ependymal tumors are not common. Muthmann has collected and abstracted fourteen cases from the literature. Flexner has reported a second case which so closely resembles the one here described, that it requires no further mention.

More recently Mallory has described three ependymal tumors, one of which was located at the mid line of the coccyx and was about the size of an orange. Microscopically it looked much like a carcinoma, but between the cells were neuroglia fibers, and in the cell protoplasm were found the granules (Körnchen) described by Weigert as characteristic of ependymal cells.

Tumors of the oblongata owing to the close approximation of the motor and sensory tracts, and the nuclei and root fibers of the eighth, ninth, tenth and twelfth pairs of cranial nerves, together with centers of respiration, circulation and those controlling the vasomotor nerves, create symptoms which are very characteristic, such as nerve deafness, paralysis with atrophy of the tongue, soft palate, muscle of pharynx, producing dysphagia, dysarthria, or paralysis of one or the other vocal cords. Of common occurrence are disturbed heart action, attacks of dyspnea, of Cheyne-Stokes breathing, and polyuria. These symptoms are frequently accompanied by bilateral or alternating paralysis of the extremities, with or without sensory disturbances or ataxia, and marked increase of the deep reflexes. Tumors of the fourth ventricle when compressing its floor are accompanied by very marked vasomotor, cardiac and respiratory changes together with other bulbar symptoms. Not infrequently sudden death ensues from the sudden compression of the node vital of Flourens. In this case none of the above mentioned symptoms were present, and the autopsy showed that the growth grew dorsally through the posterior medullary velum into the median lobe of the cerebellum, compressing and in part destroying it. It is remarkable, owing to the position and size of the tumor, that the important tracts and centers in the medulla were not early involved.

NOTE.—Neuroglia stains were not successful as the tumor had been left in the hardening fluid (Müller's) for a year or more.

LITERATURE.

- Case. 1. Flexner. Johns Hopkins Hospital Bulletin, 1891, p. 115.
- Case 2. Muthmann. Ziegler's Beiträge, 1903, No. 34, p. 445.
- Case 3. Weigert. Festschrift zum 50 jährigen Jubiläum des ärztlichen Vereins zum Frankfort, 1895.
- Case 4. Mallory. Journal of Medical Research, Vol. VIII, June, 1902.

ON THE ASSOCIATION OF EPILEPSY WITH MUSCULAR CONDITIONS FITTING BEST INTO THE CADRE OF THE MYOPATHIES.*

BY ONUF (ONUFROWICZ), M. D.,
OF SONYEA, N. Y.

The cases to be reported here are of interest, not only by the clinical combination mentioned in the title which they presented, but also by the manner in which they were discovered. It was intended to study in a dozen male cases of idiopathic epilepsy the blood and gastric functions. To establish the idiopathy, a negative process had naturally to be resorted to,—namely, exclusion of all those factors that would make, or even tend to make, a case non-idiopathic, such as: natal, or other cerebral traumatism, organic diseases of the nervous system in general, alcoholism, the symptomatic convulsions of Bright's disease, and others which it is needless to mention here. Suffice it to say that although the search was made among the best—i.e. most intelligent class of patients of the Craig Colony—comprising the study of over fifty histories, yet by the “weeding” process applied in order to exclude all those in which there was more or less suspicion of non-idiopathic factors, the number of available cases dwindled down to fourteen, which after a superficial examination (without stripping the patients) seemed to fill the requirements of their ensemble, seemed to most properly belong among the idiopathy. Closer examination proved, however, that six of these fourteen cases showed muscular conditions which in their ensemble, seemed to most properly belong among the myopathies, although they presented some features deviating from the usual attributes of this disease group.

Of the histories of these cases preceding their examination, by myself, I present the principal facts. These were gained partly from the admission papers of the patients, partly from notes by members of the medical staff of the Colony, for which the writer here expresses his indebtedness.

On the development and direct¹ heredity of the muscular

*Read at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.

¹ Meaning the presence of the same muscular conditions in blood relatives.

conditions mentioned, definite data were elicited by the writer only in two cases (I and VI), in both of which the family character of the disease seemed well established, or at least very probable from the statements obtained. In Case V no reply was received to a detailed letter of inquiry comprising the points mentioned. In the remaining three cases (II, III, IV) letters of inquiry of the same character were answered in such an unintelligent manner that the information obtained proved worthless. The patients themselves were unable to give any data in this respect. All cases were males.

HISTORIES.

Case I.—R. P. Cl., aged twenty-three, admitted to the Craig Colony, August 23, 1904.

Family History.—No neurotic heredity so far as known, except that one brother has "wing scapulæ" like patient.

Personal History.—Born at full term. No birth traumatism.* Dentition began at $3\frac{1}{2}$ months, was difficult and accompanied by convulsions, the first one at age of 6 months. Has had epileptic seizures ever since, occurring at intervals of six weeks to four months, more severe now (i.e., time of admission) than formerly. Mostly nocturnal. Yells in seizures, bites cheek, but does not wet bed. Aura: cold feeling in precordium, passing to head. Excited prior to seizures, and depressed after.

No mental deterioration.

Patient's lumbar lordosis and wing scapulæ were noticed by father at age of about fourteen or fifteen, the genu recurvatum about the same time. Onset was gradual.

Examination March 1, 1905.—Patient shows distinct wing scapulæ, more apparent on left side. Infraspinatus flattened on both sides. Lumbar lordosis of rather marked degree. No flat-foot. Deltoids seem somewhat undersized as compared with other muscles. Left deltoid is decidedly smaller than right and decidedly undersized as compared with other muscles.

Reflexes.—Knee-jerks: absent without reinforcement, subnormal with reinforcement.

Ankle-jerks: both good and equal. Deep reflexes of upper extremity present but not increased.

Plantar reflex: chiefly toe flexion and thigh type; equal on both sides.

Cutaneous sensation: normal everywhere; also deep sensation.

Electric reactions.—Faradic response: diminished in left del-

*Parents say that head was misshapen at birth, and that the attending physician "moulded" it back into shape, and they think that this "moulding" may have caused some injury to the brain. But there never was any paralysis.

toid, upper right trapezius, and right serratus as compared with other side.

Galvanic response: sluggish in left infraspinatus.

No change in formula. Deltoids respond equally.

Hearing better in right ear than in left.

Thoracic and abdominal organs and circulation normal.

Urine: 5.8 oz. in 24 hours, orange yellow. Specific gravity 1022 Reaction acid. Microscopically some squamous epithelia. No albumin. No sugar.

Mentally patient is bright: one of the most intelligent patients at the Colony; a rapid calculator; helps in the laboratory where all kinds of work requiring considerable intelligence and trustworthiness is well performed by him.

Summary of examination.—Wing scapulæ, particularly marked on left side, with flattening of infraspinatus. Lumbar lordosis, slight genu recurvatum. Lessened volume of left deltoid, anterior portion; also upper part of right trapezius and in right serratus magnus. Galvanic response diminished in right infraspinatus. Normal sensation. Patient a very intelligent one.

On March 1, 1905, at about 8:15 a.m., patient evidently had a grand mal seizure. He was seen by the writer at 8:20 a.m. with a bruise of the left cheek, i. e. a hematoma about the size of a crab-apple, and slight excoriations of the skin over it. He was sitting on a chair, leaning his head on his hands. He behaved like a heavily drugged or heavily intoxicated person. Look was glassy, speech thick, slurring.

Q. "Who am I?" No reply.

Q. "Where are you now?" A. "Sitting on a chair."

Q. "But what place is this?" A. "A room; here the stone floor, a chair."

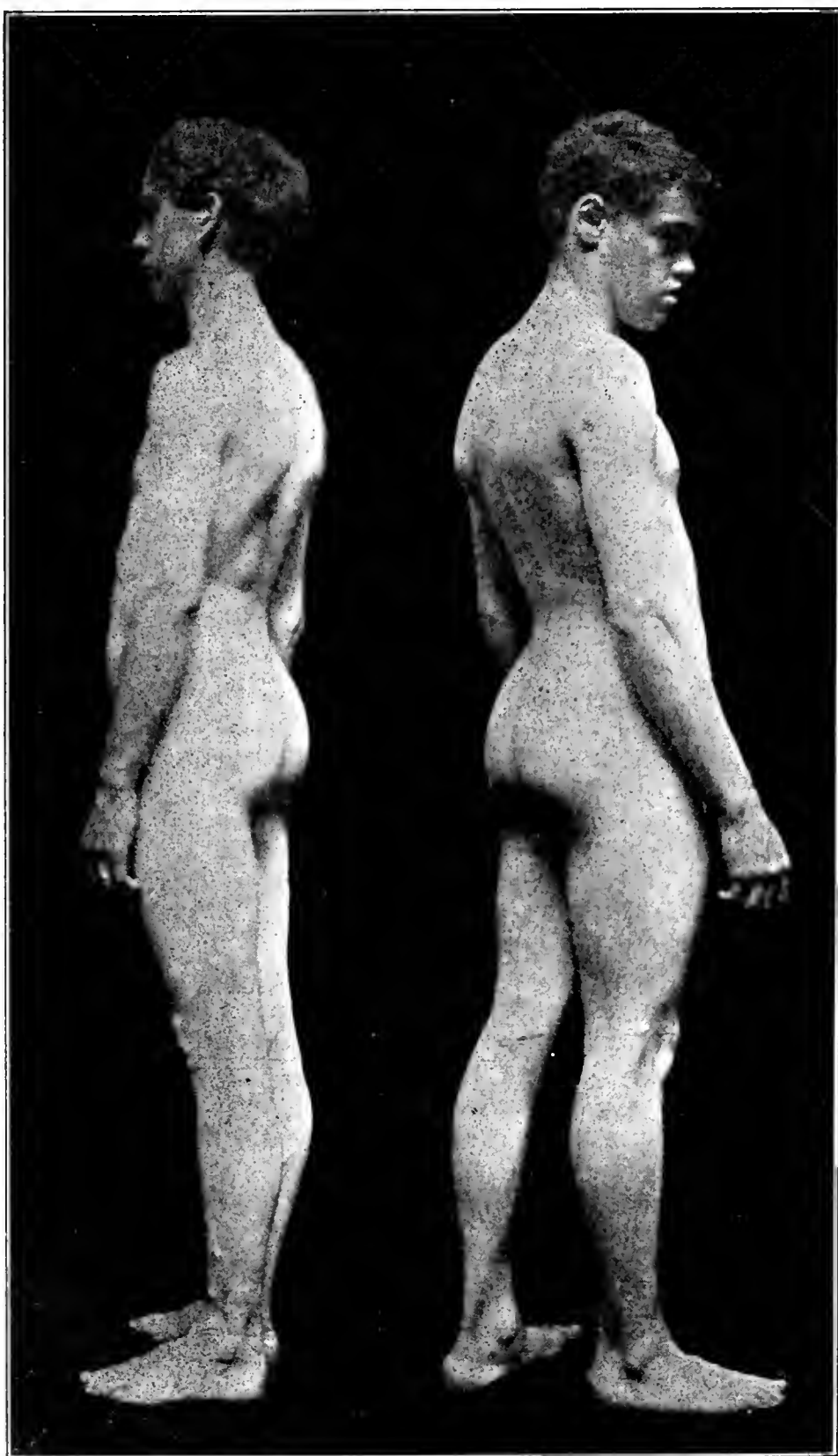
Q. "What house is that over there?" A. "Can't tell; can't think of his name. Wait, wait; no, can't think of it."

Patient evidently tries hard to give answers, seems to feel badly because he cannot give them. Asked, "What is the matter?" he says, "I feel sick."

Head is flushed, pulse rather tense. Tongue not bitten.

About 8:35 a.m. he can give the name of the man living in the house above mentioned (the gardener, Goodman), but does not know the name of the laboratory attendant, Mr. Hemstrot. Names the writer correctly. Says he remembers all the questions asked by the writer, but could not answer them. Gives evidence by repeating most of these questions, that he actually does remember them. Remains in a slightly stuporous condition for about fifteen minutes longer, altogether about thirty minutes from time first seen.

Case II. A. H., aged eighteen, admitted to the Craig Colony, July 12, 1904.



CASE I

CASE II

Family history. Father epileptic and intemperate. Maternal grandfather died from cerebral hemorrhage. Mother was frightened on the night before the patient's birth.

Personal history. No birth traumatism. No convulsions during dentition. Good physical, fair mental development. No history of traumatism of any kind.

Epilepsy began at the age of fifteen. First seizure followed a fright. Aura consists in several partial flexions and extensions of both elbows; after that becomes unconscious. Seizures of grand mal type. Attacks first came on once a month; at present every ten days.

Concerning the development of the muscular anomalies described below, the only information obtained was as follows: "Relating to the deformity of patient, will say it must have come upon him gradually, as he was not born that way, to our knowledge."

Examination, Feb. 21, 1905. Perhaps somewhat undersized; dark hair and eyelashes; rather strongly built; some lordosis of lumbar spine. Scapulae stand off at lower angles somewhat. Flat-footed on both sides.

Ears; markedly reddened, lobules broad and adherent; lacking in strength.

Face; flushed and freckled.

Palate; high and narrow.

Skull shows transverse saddle in region of coronary suture.

Abdomen; appears unusually dark as compared with rest of body. No thyroid enlargement.

Heart action; slow, about 66 per minute. Otherwise O. K.

Pulse; small.

Lungs apparently emphysematous at apices, where percussion sound is very sonorous.

Spleen and liver not enlarged.

Urine, 48 oz. in 24 hours, yellow, acid. Spec. grav. 1014. No albumin, no sugar. Microscopically, some squamous epithelia.

Linear scars over forehead. A few superficial scars (atrophic) over chest and back, reminding somewhat of past specific affection.

No enlargement of cervical glands, nor epitrochlear, nor inguinal.

Nervous System. Motor power in lower extremities not noticeably impaired; at least, not in leg muscles, excepting flat-foot. The lordosis disappears in a sitting position. Movements of muscles of upper extremities show no distinct diminution in power. Serratus muscle shows good action, but slightly more on right side than left.

No incoordination of upper extremities.

Gait shows no disturbance.

Reflexes. Knee-jerk and ankle-jerk present and equal; **not** exaggerated.

Deep reflexes of upper extremities not elicitable.

Plantar reflex of toe flexion and thigh type.

Cremaster reflex lively on right, moderate on left side. Abdominal reflex the reverse.

Epigastric reflex present.

Cutaneous sensation normal everywhere; posture—also.

Ocular movements normal.

Vision normal on both sides.

Mental response very slow, but not showing any marked defects otherwise.

Electrical Examination. Faradic response stronger in left infraspinalus (which is slightly flatter than its fellow) than in the right one.

Galvanic response: An. C. C. > Ca. C. C. in right deltoid muscle, and response is sluggish as compared with other muscles. (The right deltoid is somewhat fuller than the left. Patient is right-handed, but other muscles of right upper extremity are not more voluminous.)

Summary of Examination. Congestion of face, particularly ears. Flat-footed on both sides. Lordosis of lumbar spine, disappearing in sitting position, and suggestion of wing scapulae (the lower angle stands off.) No muscular atrophies or hypertrophies. Reversal of galvanic formula in right deltoid. Increased faradic response in left infraspinalus. No noticeable motor weakness in the groups concerned.

Knee jerks and ankle jerks present.

Slow heart action (66). Otherwise thoracic and abdominal organs normal.

Intelligence fair, but mental processes markedly slow.

Case III. L. J. Co., aged 16, admitted to the Craig Colony, March 4, 1901.

Family History. Mother nervous. Father had sick-headaches. Paternal ancestors tuberculous.

Personal History. Labor was "very severe." (Another statement says "prolonged.") Delivery natural. No birth injury noted. No convulsions immediately after birth. Had measles and whooping-cough. "Worm fits" at age of 2 (four convulsions.) At age of 8, after riding in sun, had a severe convulsion. Epilepsy dates since then. Had as many attacks as eight and nine in one day. Aura: choking sensation, sometimes nausea or cough. Light attacks seem to be aborted by swallowing salt.

Admitted to the Craig Colony, March 4, 1901.

March, 1902, mild diphtheria attack.

October, 1902, erysipelas of head.

Examination, February 21, 1905. Head broad and large, bulging somewhat in temples, and suggestive of hydrocephalus. Complexion and hair light. Stature tall.

Hands covered with numerous white spots looking like scars seen on blacksmiths.

Hard palate well shaped.

Teeth well shaped, especially the lower incisors, with exception of a slight notching in latter.

Several scratches on right forehead from recent seizure. Tongue shows no scars.

Thyroid gland not enlarged.

Abdominal organs; nothing abnormal except slight right inguinal hernia.

Urine: 41 oz. in 24 hours, yellow, acid. Spec. grav. 1018. Microscopically, squamous epithelial cells. No albumin, no sugar.

Motility of lower extremities shows nothing abnormal except double flat-foot.

Upper extremities: scapular muscles poorly developed as compared with other muscles, and decidedly reminding of wing scapulæ. Inner border stands off and is remote about width of examiner's hand from spine; lower angle also standing off.

Dynamometer; right hand 80; left hand 84.

Reflexes. Knee-jerks equal and normal. Ankle-jerks sluggish, weak, and equal.

Plantar reflex of Babinski type on both sides.

Left cremasteric lively; right weak.

Epigastric and abdominal reflexes present.

Electric examination. Reversal of galvanic formula in left deltoid and in facial muscles of both sides, direct and indirect.

Sensation: no disturbance of cutaneous or deep sensation; all qualities tested. Testicles not hypo-algetic.

Ocular movements normal. Pupils equal and normal; react to light and accommodation.

Vision normal on both sides.

Hearing normal.

Sense of taste normal.

Mentally fairly bright. His general information, in view of general education, good.

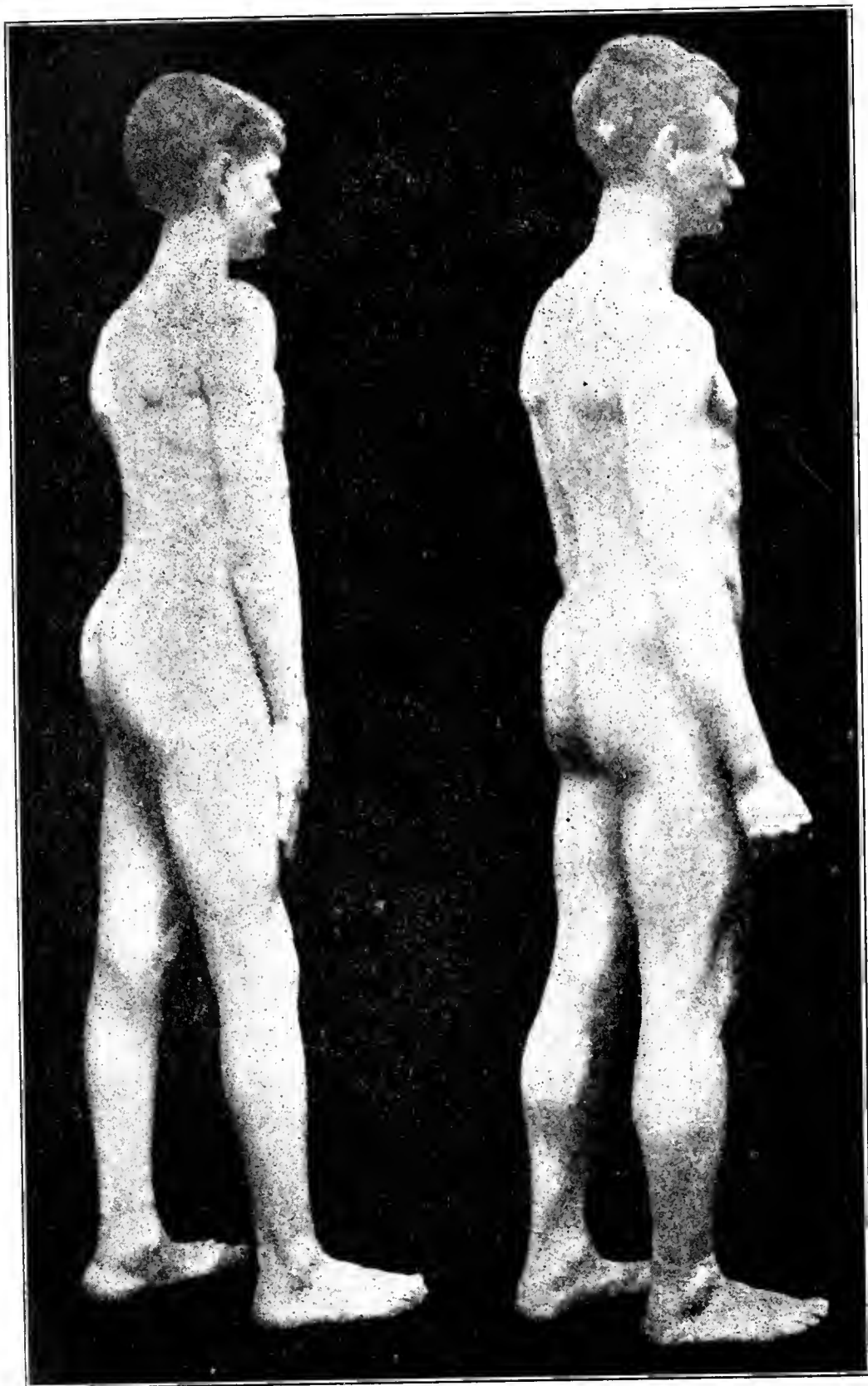
Summary of examination. Large, broad head, bulging somewhat in temples. (hydrocephalus (?)). Flat-foot, lumbar lordosis, and suggestion of wing scapulæ. Babinski type of plantar reflex. No marked (definite) muscular weakness corresponding to regions concerned (lordosis, etc.). Reversal of galvanic formula in left deltoid and in muscles of both sides of face.

Fair intelligence.

Case IV. M. J. O., aged 29, admitted to the Craig Colony, December 19, 1902.

Family history. No neurotic heredity.

Personal history. Full term birth. Normal labor and delivery. Whooping-cough at 8 years. Dentition without convulsions. Frequent attacks of nose bleed between ages of 18 and 20. No injuries. Epilepsy began at age of 6, "acted as if brought on by



CASE III

CASE IV

worms." Seizures consist in loss of consciousness, convulsion and foaming at the mouth. Very weak when coming to. No aura. Severe and mild seizures. Attacks occur about every week.

A scoliosis was noticed in patient but it was thought it came from the attacks.

No other information was obtainable regarding the muscular conditions present.

Examination, February 27, 1905. Patient medium-sized man, rather slender build.

Ears well-shaped, but lobules small.

Upper incisors protruding considerably, the lower incisors directed backward, causing prognathism of upper jaw.

Heart action and sounds normal, except occasional reduplication of second sound over left ventricle. No enlargement.

Pulse 72, soft in character.

Lungs nothing abnormal. Clear vesicular murmur everywhere.

On palpating spleen a gurgling sound is heard on pressure with every expiration.

Urine, 45 oz. in 24 hours, orange yellow, acid. Spec. gravity, 1017. No albumin; no sugar. Microscopically squamous epithelial cells.

Liver and spleen not palpable.

Left naso-labial fold deeper on left side of face, showing in general stronger innervation than right. Cannot whistle; puffs out cheeks defectively. Fibrillary twitchings in right orbicularis oris.

His right scapula sometimes lower than left. When lower there is a distinct scoliosis of upper dorsal spine, with concavity to right. Right shoulder is lower, entire right scapula seems smaller than left, though this may be due to stronger development on right side of upper trapezius, supraspinatus and infraspinatus muscles. Left scapula stands off considerably on inner border and lower angle.

Dynamometer: Right, 127; left, 115.

Slight vibratory tremor of hands; otherwise motility of upper extremities is not disturbed.

Flat-foot on both sides. The right leg, thickest portion of calf, about 2 cm. smaller than left.

Gait and station, nothing abnormal.

Power of leg muscles good. After some standing shows decided lordosis, though not marked.

No evidence of spasticity of movements of upper extremities.

Electrical Examination. Direct faradic response slightly stronger in muscles of right side of face. The left naso-labial fold is deeper. No galvanic change in facial or other muscles.

Reflexes. Knee-jerks fairly lively on both sides.

Ankle-jerks good and equal on both sides.

No ankle clonus.

Biceps, triceps and radius reflex present on both sides and fairly active.

Plantar reflex of toe flexion type on both sides, and slight.

Cremasteric reflex slight on right and practically absent on left, but on left side the test for the reflex produces contraction of left abdominal muscles. This in less degree present also on right side.

Abdominal reflex rather slight on both sides.

Epigastric reflex fair.

Cutaneous sensation: Tactile sense normal everywhere, but pain sense rather dull in general. Temperature sense normal.

Deep sensation not disturbed anywhere.

Skin; marked varicosities on right calf; long linear scar over chest in front; rather strong acne on back, moderate on face.

Vision 10-10 on both sides, no contraction of visual fields.

Sense of taste. It is so difficult to make patient comprehend the conditions of test that reliable data cannot be obtained.

Olfactory sense. Test used, ammonia, spirits of camphor, oil of cloves, oil of wintergreen. Patient says every time, "Cannot tell what it is," then adds, "Thought I smelled ammonia."

Ocular movements normal.

Pupils equal; reaction good.

Mental condition, oriented as to date and place.

General information deficient and comprehension slow.

Summary of Examination. Marked prognathism; flushed face. Asymmetry in facial innervation. Fibrillary twitchings in right orbicularis oris. Flat-footed; slight lumbar lordosis; right scapula lower than left; right upper trapezius, supra- and infra-spinatus muscles flattened. Some muscular scoliosis of upper dorsal spine, concavity to right. Direct faradic response in muscles of left side of face weaker than right. Slowness of mental grasp. Defective general cerebration. Nothing abnormal on part of sensory examination, nor of heart, lungs, liver and spleen.

Case V. G. H. S., aged fifteen, admitted to the Craig Colony Aug. 23, 1904.

Family History. Three maternal aunts died from tuberculosis. Mother had slight headaches (from endometritis [?]). Patient an illegitimate child (?) cared for by foundling society in New York.

Personal History. Born at full term. No birth traumatism. No convulsions during dentition and infancy. When learning to walk had some difficulty in using right leg. Measles and pertussis at age of eleven months. Convulsions for two months with measles, and bleeding from ear and nose at same time. Scarlet fever at sixteen months, diphtheria at two years. Epilepsy said to date from age of 12. First seizure: Vertigo, then loss of vision.

falling to ground and becoming unconscious for thirty minutes. No cause assigned. Seizures continued every six or eight hours for two days. Three weeks later had other seizures. At time of admission average about once a week and nocturnal. Formerly both night and day attacks. Used to wet bed in seizures. No aura.

Examination, Feb. 28, 1905. Patient shows marked pes valgus, lumbar lordosis, and standing off of lower angle and inner border of scapulæ. Right shoulder drooping; slight lordosis of upper dorsal spine, with concavity to the right. Lumbar lordosis disappears in sitting position. Right supraspinatus is decidedly, though not markedly, flatter than left. Can stand on tiptoe, but not well on heels. No difficulty in climbing chair. Extensors of hip are weaker than flexors. However, diminution of power not distinctly evident otherwise. Shows some degree of genu recurvatum.

Reflexes. Knee-jerks present and equal, rather sluggish; otherwise not distinctly diminished with reenforcement.

Deep reflexes of upper extremity not elicitable.

Power of deltoid muscles decidedly diminished, and these muscles look decidedly wasted as compared with other muscles.

Electric Examination. Faradic response stronger in left deltoid in lateral portion than right; anterior portion, the opposite.

Galvanic response in right deltoid is decidedly sluggish, and An. C. C. > Ca. C. C.

(Facial innervation at times stronger on left side than on right.)

Urine, 55 oz. in 24 hours, orange yellow, acid. Spec. gravity 1020. No albumin, no sugar. Microscopically squamous epithelial cells.

Summary of Examination. Flat-foot, genu-recurvatum, lumbar lordosis, incipient wing scapulæ; some wasting and diminished power of deltoids; reaction of degeneration in deltoids. Some asymmetry of facial innervation.

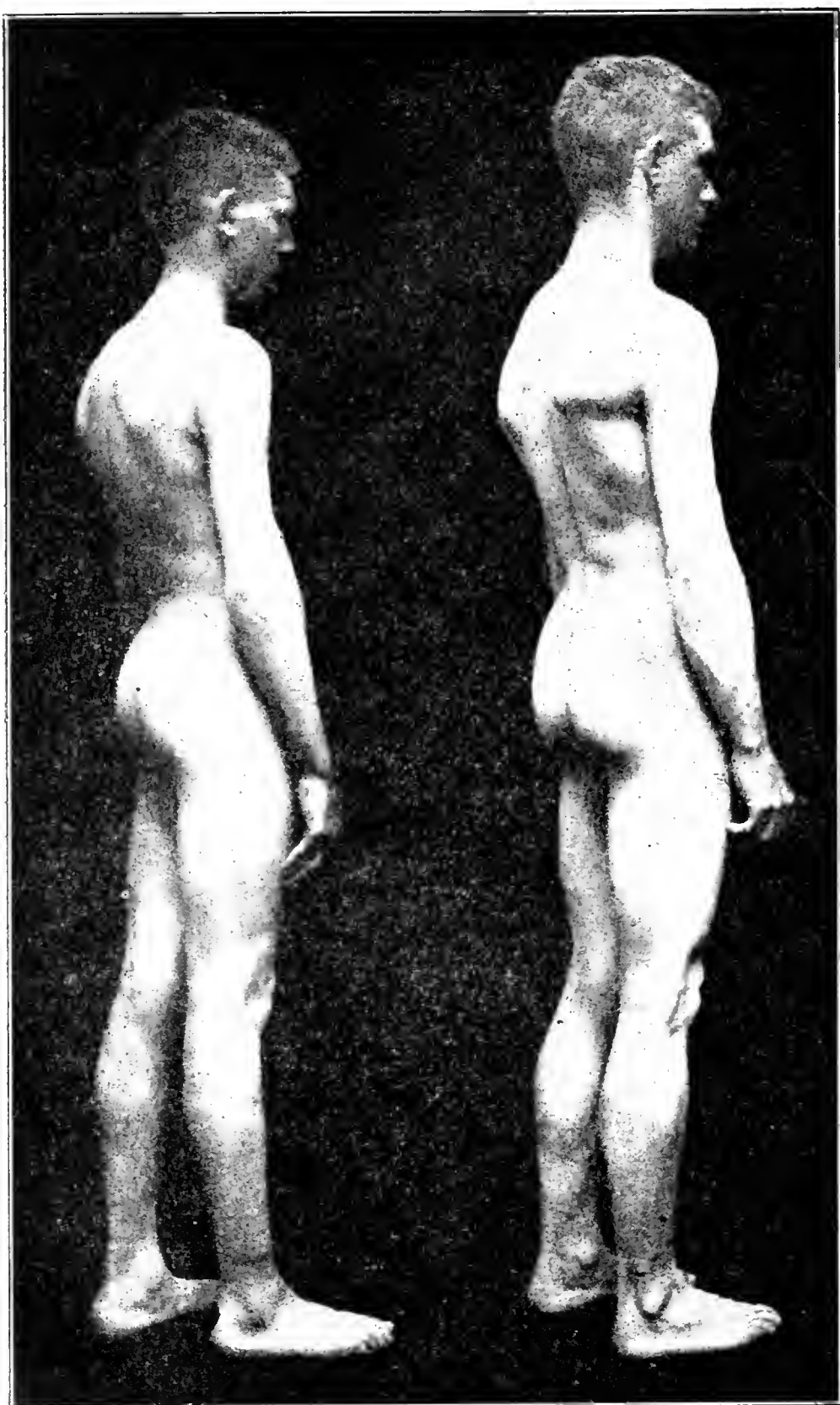
Case VI. H. D. G., aged twenty-three. Admitted to the Craig Colony March 6, 1900.

Family History. Father and paternal father were inebriates. Paternal grand-aunt and grand-uncle were insane. One brother had infantile paralysis. Paternal aunt committed suicide.

Patient's sister was "very round-shouldered at one time. She went to the gymnasium and she stands very straight now, but her shoulders protrude very hard. She has a deep hollow between them, so you can notice it very plainly when she has a thin waist on. She is very much like patient—tall and slim—but in good health."

A maternal uncle of patient "had the same curve in his back" (lumbar lordosis) as patient.

Personal History. Measles at age of eighteen months, complicated with ulceration of left cornea and followed by complete loss



CASE V

CASE VI

of vision of that eye. Had convulsions for about ten days after measles, but after that had no more "fits" until age of eleven, when he began to have "fainting spells." At thirteen first grand mal attack, after which unconscious for several hours. No aura. Maniacal at times.

In a letter of inquiry directed to patient's mother, attention was called to the wing scapulæ, the lumbar lordosis (not very pronounced), and the flat-foot which patient shows. Questioning regarding the onset of these conditions elicited the reply: "He never complained of his back until after the age of fourteen years, after the attacks commenced. Seven or eight years ago Dr. Keegan circumcised him, and said he was as perfect a man as he ever saw. His feet were all right as long as I cared for them."

During stay at Colony, once (Feb. 12, 1900) ran away, freezing some toes. Nothing said about character of seizures at Colony.

Examination Feb. 25, 1905. Patient fairly well-nourished man of dark complexion and hair; of fair muscular development; the scapulæ standing off somewhat at lower angle and inner border, the left one slightly ($1\frac{1}{2}$ inches) higher than right, and the inner border about 2 inches further from spine than that of left side. The supraspinatus and infraspinatus on that side decidedly flattened. Shoulders sloping. Flat-footed on both sides. Lumbar spine seems slightly lordotic. Right large toe was amputated at distal joint.

Dynamometer Test. 95 on either side.

When patient holds hands extended in front of him and against each other, and the hands are forcibly drawn apart, the standing off of scapulæ becomes quite marked, as does the lumbar lordosis. This takes place only on attempt of drawing arms apart, showing thus weakness of serrati magni.

Patient can stand well on tiptoes, but not so well on heels.

Aside from conditions mentioned, no muscular atrophies are seen.

Reflexes. Knee-jerks equal, normal.

Left ankle-jerk present; right absent.

Deep reflexes of upper extremities quite active, not distinctly exaggerated.

Cutaneous reflexes; plantar on left side of Babinski type; on right side difficult to judge on account of amputation of toe.

Cremasteric reflex weak on left, absent on right.

Abdominal and epigastric reflexes present and equal on both sides.

Cutaneous sensation; localization and temperature sense excellent everywhere; responses very prompt.

Pain sense good everywhere except in testicles, which are practically entirely analgesic.

Deep sensation good everywhere.

Electric reactions: serrati magni act equally on both sides; infraspinatus stronger on right than on left side. Reversal of galvanic formula in both deltoids.

Left cornea shows an anterior staphyloma. Iris is almost entirely adherent to cornea. Phthisis bulbi.

Right eye: Pupil shows reaction to light and accommodation.

Motility normal.

Face. Region of left cheek somewhat sunken, but left nasolabial fold deeper than right.

Ears stand off a little, lobules adherent.

Palate only slightly arched, broad. On opening mouth wide, uvula retracts entirely into soft palate.

No thyroid enlargement.

Heart action is not increased

Pulse 68 per minute, soft in character.

Heart-sounds normal.

Some asymmetry of thorax, the left side being somewhat saddled in left lower part; border of ribs slightly turned out.

Lungs, spleen and liver show no abnormalities.

Urine, 36 oz. in 24 hours, orange yellow, acid. Spec. gravity 1034. No albumin, no sugar. Microscopically squamous epithelial cells.

Mental faculties. Very prompt in tests made on him (sensory, etc.); also shows no sluggishness in replies generally, but his general information deficient.

Summary of Examination. Phthisis of left eye. Rachitic thorax. Flat-foot. Slight lumbar lordosis. Suggestion of wing scapulæ. Flattening of right and left infra- and supraspinatus muscles. Reversal of galvanic formula in both deltoid muscles. Absence of right ankle-jerk. Normal sensation except analgesia of testicles.

DISCUSSION OF CASES.

Summing up, we find here a group of epileptics presenting partly muscular atrophies, partly defective muscular action without clearly demonstrable atrophy, with definite distribution of these disturbances, manifested on the whole as follows:

1. Wing-like standing off of the scapulæ, due apparently chiefly to weakness of the trapezius, possibly also serratus magnus, rhomboideus, and levator anguli scapulæ muscles.

2. Atrophies of the scapular muscles in a strict sense, namely, infra- and supraspinatus; also occasionally of the deltoids and other muscles of the shoulder joint.

3. Lordosis of lumbar spine in erect position, disappearing in sitting position, a phenomenon clearly explained already by Gowers in "Pseudo-muscular Hypertrophy" as due to weakness of

the extensors of the hip, causing an inclination of the pelvis forward and compensatory bending backward of the body.

4. Pes valgus.

5. Involvement of the facial muscles (two cases only).

6. Electrical changes manifested most frequently by a reversal of the galvanic formula, particularly in the deltoid muscles.

7. Fibrillary twitchings (two cases).

The said muscular symptom-complex was not present in all cases alike and in the same degree. In some cases the lordosis was chiefly developed, in others the wing scapulæ, and the flat-foot was present in all cases but one; the facial involvement was found in only two. Qualitative galvanic changes were found in at least 4 cases; fibrillary twitchings in two.

The classification of this symptom group is rather difficult. The distribution of the muscular disturbances conforms best with that of the myopathies, but the presence of qualitative electrical changes (reversal of the galvanic formula) found in at least four cases, and the presence in two cases of fibrillary twitchings, speak rather against it. However, Sachs¹ calls attention to the fact that fibrillary twitchings have been seen in some cases that appeared typical myopathies, and that the electrical reactions have been found considerably altered in similar cases. Therefore, the presence of these two disturbances (qualitative electrical changes and fibrillary twitchings) would not necessarily exclude the cases reported here from the class of the myopathies.

The presence or absence of the disease in other members of the family to which the patient belongs has been used for differential diagnosis; its presence being in favor of the myopathies, its absence in favor of the spinal form of muscular atrophy.

In this respect the information gained regarding the cases here reported is, unfortunately, very defective. In the two cases (I and VI) in which intelligent information was elicitable the family character of the disease seemed established.

Of interest is the association of the malady with epilepsy—an association which I have not found mentioned in any of the familiar text-books on nervous diseases. The interesting question arises whether a case of epilepsy thus complicated can be called idiopathic or not. If we have to deal with a spinal form of muscular atrophy, then it would be rather risky to consider the

¹ B. Sachs. "A Treatise on the Nervous Diseases of Children," 1895; page 406.

epilepsy as idiopathic. But if the muscular affection is to be classed among the myopathies, then the appellation "idiopathic" for the epilepsy may be permissible.

How many cases of epilepsy we shall still be allowed to call idiopathic, after careful examination and history, remains to be seen. But somehow, the more thorough the inquiry and examination the less becomes the percentage of cases to which the appellation "idiopathic" remains justifiable.

There is still one possibility to be discussed, namely, that of the muscular conditions being secondary to, *i. e.*, the effect of epileptic seizures.

Dr. Spratling has privately communicated to the writer a case in which a condition of muscular weakness and resulting attitude, associated with atrophies and quantitative electrical changes of certain muscles, was seen to develop after a series of severe epileptic convulsions, and which he therefore called epilepogenic myopathy.

Whether in the six cases above reported such an etiology and interpretation might be assumed cannot be decided offhand. However, on the whole, the similarity of the clinical picture with that of the genuine myopathies makes it more plausible to class them among the latter.

Dr. Pierce Clark, in a private discussion of the writer's cases, has suggested a possible casual connection with rickets. Future observations will have to show whether such a casual relation can be assumed. One of the patients (VI) showed a decidedly rhachitic thorax. In others, changes of the teeth, palate or skull were somewhat suggestive of rhachitis. This is about all that can be said on this point.

CASE OF MULTIFORM TIC INCLUDING AUTOMATIC SPEECH AND PURPOSIVE MOVEMENTS.*

BY MORTON PRINCE, M.D.,
OF BOSTON.

I have the opportunity of presenting to you to-night a very remarkable case of tic. The patient was sent to me by Dr. John E. Donley, of Providence, who recognized it as a case of tic, though a correct diagnosis had escaped previous observation. As you will see, the tic is really multiform, or rather there are several distinct tics in this case. Some consist of ordinary choreiform movements of the eyelids, face and arms, while others are complex purposive movements of different kinds. Many of these automatic physiological movements are remarkable in themselves, but most unusual are the automatic speech which is interjected in the midst of nearly every sentence that he utters, and certain purposive movements when he handles a razor or knife. The affection began twenty years ago, when he was 15 years of age. In the beginning it was only a choreiform opening and closing of the eyelids of the usual type. Then at a somewhat later period the facial muscles became involved, and later still the head became affected, the movements being at first from side to side, and later up and down. At a still later period the shoulders became affected with various jerking movements, and then the arms and legs became involved. The tendency of the movements is for a time to be concentrated in one or other of these parts, although never absolutely limited to any particular region or tic, and then to give place to one or another of the different tics. Several tics may be present at the same time as is the case now.

About five years ago the involuntary automatic speech developed. It came on in this way, according to his description: At first there were spasmodic movements of the larynx, resulting in explosive, but meaningless, sounds. Then a distinct articulate sound or word was produced, namely, "chut." This was interjected in the midst of his sentences over and over again. After

* Presented at the meeting of the Boston Society of Psychiatry and Neurology, March 16, 1905.

this other articulate sounds were introduced, but almost always of a profane and obscene nature. Some of these cannot be mentioned, but you will have an opportunity of hearing this phenomenon when he is questioned. The next automatic words were "Christ, no"; "Hell"; "Hell-nigger"; "Nigger-to-hell," etc. These and others which are unmentionable, as you now hear, were interjected in the midst of every sentence. When I asked him, for example, whether he has had difficulty in pursuing his occupation, he replies "Christ, no; hell-nigger,———" in an explosive, jerky way, and then quietly and calmly adds, "Yes, I have been obliged to give it up." In the midst of his next sentence he is again interrupted by the repetition of the same words, or one of the other phrases which constitute his automatic vocabulary. This explosive speech is always a repetition of one or more of the same phrases.

The origin of these phrases is of interest. According to his statement, they have occasionally arisen from the twisting of one word into another one of a like sound, but in the great majority of instances they are reproductions of words that he has heard. For example, the one which is constantly uttered followed a joke played under embarrassing circumstances before a lady upon a foreigner who mispronounced an English word. At the time he was covered with mortification. This emotional element, including apprehension lest he should intentionally utter the obscene word, was plainly a factor in the genesis of this tic-word. Other words were accidentally heard in the street or elsewhere. Some phrases have been constructed by suggestions from the environment. For instance, after "hell" was incorporated into his tic vocabulary he was watching some negroes at work. The thought of how mortifying it would be if he should address one of them, whom he personally knew, as "nigger" came into his mind. Straightway he broke out with "hell-nigger," a phrase which still persists. Naturally he has a nice mind, is well-mannered, well spoken of, and feels keenly his affliction. This very fact, I think, is a factor in the psychosis. His affection is much worse when he is particularly desirous of suppressing it, as in the presence of strangers and ladies. In other words, the more apprehensive he is that he will exhibit himself the more liable he is to do it and the more difficult it is to control himself. Thus he is particularly liable to this automatic speech and the convulsive movements in

the street and railway cars, though he makes use of various devices for their control, such as coughing, clearing his throat, etc., by which the vocal organs are brought into action for other purposes than speech. He consequently in public is obliged to voluntarily make all sorts of sounds to suppress his automatic speech. In describing his affection he writes: "The things I most dislike to do and say are the things I must do and say; for instance, I am a sign painter, and when painting on a white card with black paint on the brush I try not to shake my hand, and the more I try the more my hand shakes and the sign is spoiled; or when in the company of strangers, or more particularly ladies, I say some very nasty words which some time ago I would have cut my throat rather than say before a lady."

He is entirely unaware of what he will say automatically until the words are actually spoken. At times he can suppress the tic temporarily by a great effort, but at other times, and as a rule, he cannot do it. In reading aloud his sentences are also interrupted by these tic phrases.

The automatic purposive movements of his hands which you will observe when I hand him this sharp-pointed dirk are equally interesting. I ask him to pretend to shave himself with it, as if it were a razor. You notice that the pretended action of shaving is constantly interrupted by movements which he cannot control. The point of the knife plays about his face and eyes in a violent and apparently dangerous manner, and is startling to witness until you realize that he will not injure himself. You will notice, too, that these automatic, jerky movements of the knife have a purposive character, and are not simply incoördinated choreiform movements. They are indistinguishable from volitional movements. With the dirk in his hand he pretends, so to speak, that he will jab the point into his eyes and his face, but when I hand him a razor the movements take a different form, and instead of pretending to jab himself he slashes the razor in a reckless way about his face, as if he would cut his cheek or cut off his nose and ears or slash his throat. It seems at first sight as if these movements were deliberately intended, but he cannot inhibit them. You will notice, too, that the blade sometimes plays close to the skin with considerable skill. He says it is the same when he shaves himself alone, but that he has not the slightest fear that he will cut himself, but on

the contrary, believes that there is a Divine power that will protect him.

Besides these tics he has a number of others, also purposive: bilateral movements of the face, resulting in grimaces; jerkings of the head; blowing through the nose, as if clearing it; clearing the throat; coughing; abdominal spasms; curious tongue sounds and lip sounds, difficult to describe in words.

His writing is interrupted by spasmodic movements of the hand, which brandishes the pencil, so to speak, and makes irregular scrawls upon the paper. His writing is never interrupted by automatically written words as his speech is interrupted.

Although he exhibits a number of tics at the same time, just as now you notice he exhibits movements of the head, several facial tics, etc., with this speech tic and the hand movements, yet most of the tics tend after lasting a varying period, perhaps two or three years, to give place to other forms.

He asserts very positively that if he ever thinks of a peculiar movement he is apt to develop it. Sometimes his tics result from mimicry, as when he caught the trick of the family doctor who always coughed in a peculiar way as he was leaving the room.

[Dr. Sidis, to whom I later referred the case for further study, has brought out the fact that by mimicry (suggestion) he can be made to repeat words spoken to him. For instance, on reading to him words at random from a dictionary, if a word is spoken suddenly he tends to automatically repeat it even in the midst of a sentence. There is a resemblance in this to the phenomenon known as *Miryachit*.]

He is unable to give an explanation of the first tic, which occurred when he was a boy, and which appears to have been the ordinary closing and opening of the eyelids. Later, when the grimaces were added his attention was called to them, and then for the first time, as he now remembers it, he became self-conscious and apprehensive. Afterwards the various complicated purposive tics developed. All the tics probably represent physiological movements and not simply muscular spasms.

The patient in other respects is to all appearances a healthy and intelligent man, a sign painter by trade. None of the stigmata of hysteria can be detected. The only mental peculiarity out of the ordinary that is remarkable is a rather excessive moral timidity and apprehensiveness. For instance, as a boy he was

morbidly apprehensive lest he might be late at school, and now he is equally so lest he may fail in an engagement or an agreement, etc. "I know myself to have," he writes, "and I always did have, a certain timidity which I am not able to explain, and still I am afraid of nothing (physical). I remember when a boy going to school I would run all the way, and half-crying, through fear of being late, and all through my life I was afraid of small things, such as being late for work or catching a train, or losing my position, or afraid that my work did not suit my employer. I am that way to this day." This apprehensive make-up has been plainly a factor in the genesis of some of the tics, though not in all.

The pathology of tics of this sort is only partly intelligible. In the first place, they belong to the class of *motor automatisms*. They are outside the will of the subject, and are repetitions of the same movements. I am indebted to Dr. Sidis for calling my attention to the fact that *sensory automatisms* can also be induced in this subject. These sensory automatisms are visions which arise when the subject gazes steadily for some time into a reflecting surface (crystal, glass of water, etc.). After a while visions representing scenes of one kind or another arise before the subject.¹ In this patient, then, both motor and sensory automatisms arise with excessive facility.

The exciting causes of the motor automatisms were various. Some of the tics seem to have been the direct result of mimicry, that is, external suggestion; as, for instance, the cough caught from that of another person, and the repetition of words suddenly spoken to him. Others seem to have been due to auto-suggestion, the thought of some *bizarre* movement or word being sufficient to produce it. But apprehension and fear seem to have been an additional and important factor in this latter group of tics. The patient insists most positively and clearly that he is always under the apprehension that he will exhibit this or that tic, and that this fear is always in the background of his mind. Exactly how much weight should be given to this general statement is not easy to say, but there is no doubt that under special circumstances marked apprehension is present, and that this emotion tends to excite or to give vent through auto-suggestion to a tic, as a sort of fear psychosis. For instance, if he has an

¹ See "An Experimental Study of Visions"; Morton Prince; Brain, Winter number, 1898.

engagement the conditions of which make it particularly desirable that he should not make an exhibition of himself, such as the presence of ladies or strangers, some time beforehand he begins to be apprehensive. He becomes anxious and more and more excited until at the moment of the fulfillment of his engagement the explosion takes place. This corresponds with other forms of fear psychoses. Likewise a fear may *originate* a new tic with this patient. Per contra, when he is alone he is never affected by automatic speech *unless some one is within hearing distance*. The consciousness that some one can overhear him is sufficient to arouse the attack. On the other hand, the tic movements occur while he is alone; but these are much more likely to break out and be more violent when he is thinking of something which he is to be called upon to do, and which from its nature makes him apprehensive of exhibiting himself. Fear, then, may be regarded as one, but not the sole, exciting factor of the automatisms.

From the very complex and purposive character of some of the movements, such as brandishing the knife, it might be surmised that these tics pointed to a doubling of consciousness and the presence of certain subconscious fixed ideas which excited the movements, if they did not direct them. But the usual hypnotic methods of examination failed to discover such ideas. Automatic writing, too, a useful device to reach subconscious ideas, could not be obtained. The failure of these methods to disclose a doubling of consciousness does not absolutely negative the possibility, for reasons unnecessary to go into here.

A similarity of some of the tics manifested by this patient to the automatic speech (swearing, exclamations, etc.) and gestures to which many normal persons are prone suggests itself. But there is a marked and important difference. Automatic swearing, exclamations and other movements of this latter class are more of the nature of absent-minded phenomena. They do not occur at the moment when the attention is directed to prevent them. The essential feature of these automatic tics is that they are not absent-minded phenomena, but occur not only involuntarily, but while the patient is making every effort to control them.

NEW YORK NEUROLOGICAL SOCIETY.

October 3, 1905.

The Vice-President, DR. J. ARTHUR BOOTH, in the Chair.

Types of Hysterical Insanity.—By Dr. Robert C. Woodman. This paper, the author said, was the outcome of a symptomatic study of the insanities during the past two and half years. Cases not clearly belonging to any well-recognized insane type had been especially scrutinized, and some had been found to show hysterical stigmata, while other atypical cases without stigmata presented mental symptoms very similar to those of the hysterics. His observation and study had shown that there were among the committed insane a considerable number of hysterics, and those cases were, in many instances, violently insane for considerable periods. Any medical classification that ignored that fact was incomplete, and concealed important clinical distinctions. The recognition that some hysterics, as such, were insane helped to bridge the gap between mental diseases and general medicine, and made more easy the conception of other insanities as thinking disorders; as functional in the same sense as ordinary thought was functional.

Dr. Woodman's paper, in summary, analyzed the symptoms that insane hysterics presented. He found the origin of the attack in emotional experiences; it pursued an episodic course; there was an absence of marked disturbance in the stream of thought, excepting in dazed and stuporous states; there was a natural point of view concerning indifferent topics; often periodic amnesia; a loss of the ability to do mental or physical work, but with little or no motor retardation, and, on the emotional side, usually anxiety and fear. Cases were quoted in which the anxious depression preceded the hysterical stigmata, notably in one involuntional case, and the question of a close relation of hysteria to anxious depressions at any time of life was raised, especially as to its relationship to recurrent melancholic attacks without manic alterations. Some non-conclusive evidence on the relation of hysteria and dementia præcox was submitted, and some other symptom-complexes which hysteria had been found to take were referred to.

Dr. Adolf Meyer said that, so far as he knew, Dr. Woodman's paper was the most documented presentation of this subject in the English language. The hysterical insanities were a rather interesting group from a theoretical point of view, inasmuch as they presented one of the clearest types of mental disorder in which the psychogenic element was uppermost. Their recognition was also of decided importance from a prognostic and therapeutic point of view. Quite a large number of the cases, indeed, the majority of the attacks which rank plainly as insanities, were, however, of a rather transitory character, and for that reason, perhaps, the need of a detailed knowledge of the disorders for their treatment had thus far aroused comparatively little interest. That phase of the subject must of necessity be preceded by a study, in broad lines, of the symptom-complex, such as Dr. Woodman's paper had given in his very interesting group of cases. While in some of these cases there was a distinct history of hysteria, with the hysterical stigmata well marked and the whole mechanism of the disease characteristically hysterical, there were others in which the symptom-complex seemed to coëxist with well-recognized forms of insanity, such as dementia præcox and the manic-depressive type, as well as involuntional melancholia, and his suggestion concerning the latter is

certainly worth attention; but under those conditions it was usually apparent that it was subordinate to the more decisive phenomena of the major affection. Some points which had of late been especially touched upon in the literature of hysteria, namely, the Ganser complex, had not been especially considered by Dr. Woodman, and perhaps with some justification, as it might well be regarded as an established fact of clinical investigation, when it goes beyond the scope of the analogous states actually described. Probably the best presentation of these cases was that found in the report of Ricklin, published in the *Psychiatrische Wochenschrift*, and reviewed in the *Psychological Bulletin* of July, 1905.

Dr. Arthur C. Brush said that if we accepted the old idea that hysteria was a phenomenon that was to a greater or lesser extent met with in the entire human race, it would be difficult to see how Dr. Woodman could differentiate between these so-called hysterical insanities and the true insanities. That the former were nothing but exaggerations of what was normally present in the human being was undoubtedly true, for even sane people had at times hallucinations and delusions and automatic dream states. The sudden onset of the symptoms in these cases of so-called hysterical insanity, and the sudden recovery from them, would sharply distinguish them from cases of true insanity, as would also the lack of mental deterioration. Dr. Brush said he did not wish to be understood from this as questioning the propriety of proper restraint in dealing with cases of so-called hysterical insanity, but until we could clearly define insanity and hysteria, he did not think we could accept the latter as a form of insanity.

Dr. William M. Leszynsky said that Dr. Woodman, in his paper, had mentioned slight contraction of the visual field as being one of the symptoms in the cases cited, and he asked how the visual field had been tested; whether by the perimeter or by less accurate methods? As a rule, it was exceedingly difficult or impossible in the majority of the insane to make a satisfactory or accurate determination of the visual field, for this required, on the part of the patient, persistent concentration of attention and considerable judgment. It was possible, however, in some cases to decide as to hemianopsia or marked concentric contraction.

Dr. George W. Jacoby said he considered the contribution of Dr. Woodman of great value, as it was an effort toward systematizing these cases of hysterical insanity so that they could be recognized from their clinical aspects. At the same time, he was rather surprised to learn that this class of cases was considered in any way unusual, and he could only explain this on the ground that they were regarded from a different standpoint by the psychiatrist and alienist in contradistinction to that of the neurologist. The latter regarded many of the somatic features of hysteria as distinct delusions, and if that interpretation was correct, then it was only one step further to the development of distinct insanity.

In the recognition of these cases of so-called hysterical insanity it would be necessary to study the previous history of the patient, and exclude the various other forms of insanity, such as epileptiform insanity, delirium of various kinds, catatonia, etc. Given a case in which there was a previous history of hysteria, together with the course and clinical features pointed out by Dr. Woodman, and the diagnosis of hysterical insanity could, in time, be made; but whether a diagnosis could be made from the course alone without such a previous history of hysteria was questionable. The value of such an early diagnosis lay chiefly in the prognosis and treatment, but the speaker said it would be a decided mistake to believe that all cases of hysterical insanity were of short duration. He recalled instances where recovery was delayed for two or three years.

Dr. Jacoby said he agreed with Dr. Leszynsky that it would be exceedingly difficult to base the diagnosis of hysteria upon somatic symptoms, such as restriction of the visual field, hemianesthesia, etc., because patients

of that class were usually very unreliable in their statements, and susceptible to suggestions of all kinds

Dr. Edward D. Fisher said he would certainly draw a distinction between cases of mental diseases occurring in those who gave a previous history of hysteria and in those who gave no such history. The former, as a rule, did not run the typical course observed in melancholia or in so-called mania, using the older terms, but they might assume more of the paranoic form. The duration of these hysterical insanities, as Dr. Jacoby had said, was often quite prolonged. He recalled cases of this kind where restraint became necessary on account of the development of suicidal or homicidal tendencies, and where some mental instability persisted for some time after the disappearance of the acute symptoms.

Dr. Fisher thought we were justified in classifying certain forms of insanity as hysterical, as this term clearly explained the nature of the case. While the term was, perhaps, not purely scientific, it was a true representation of a certain mental state occurring only in those who had the stigmata of hysteria. He was inclined to regard the term hysterical insanity as a more or less valuable one, as really representing an entity, if not a well-defined one.

Dr. William B. Noyes said that within the last six months he had seen two cases where the diagnosis between hysterical insanity and dementia præcox or some other psychosis had been a matter of careful consideration. One of these was a woman, aged thirty, who had sustained a fall and had been treated in a hospital for contusion of the back. Two months later she suffered from attacks of unconsciousness, coma and convulsions, four or five times, lasting in all about five days. There was no lesion of the kidneys. She was again treated in the hospital and had occasional auditory hallucinations. When he examined her she had tremors, increased knee-jerks and isolated areas of absolute analgesia and anesthesia. She showed great weakness in walking. The diagnosis of traumatic hysteria seemed plausible. During the following days she became excited and at times almost maniacal, at other times much depressed. At a subsequent examination she had no anesthesia, but an area of hyperesthesia in the middle of the back. Mentally she was silly, but neither depressed nor excited. A day or two later she was sent to an insane asylum, having again become excited. Notwithstanding the fact that the subsequent history of the case may indicate a condition of dementia or some other definite psychosis, the name of hysterical insanity covers all the clinical data at present obtainable.

The other case was that of a young married woman, aged twenty-five. She resided with her husband's relatives, who were exceedingly neurotic. She had nursed a case of typhoid fever just before her marriage. Before the present illness she had suffered from three mild attacks of hysteria, with cramp-like symptoms and much prostration, but no special mental disorder. When Dr. Noyes saw her last spring she had a typical attack of hysteria major, starting with convulsions and coma. There were no evidences of uremia. The convulsions were followed by a dream-like condition and semi-coma, failure to recognize her friends and transitory hallucinations. Her condition gradually improved, and she was well in three weeks. There were no areas of anesthesia in the brief examination the speaker was able to make, nor any well-defined hysterical stigmata, excepting the peculiar conformation of her face. In her case the mental symptoms were so severe for about three weeks that no one could have distinguished between hysteria and developing dementia præcox. The fact of several years of mild or grave hysteria was positive; the transitory nature of the mental disturbance was against dementia præcox.

Dr. J. Arthur Booth, after referring to the several interesting types of so-called hysterical insanity illustrated in Dr. Woodman's paper, said that the type in which there were convulsive seizures and hemianesthesia,

with narrowing of the visual field and marked emotional disturbances, was not difficult to recognize. In some of the other types referred to, however, the diagnosis of hysterical insanity should be made with great circumspection; for, just as in many organic diseases of the nervous system hysterical disturbances were not infrequently observed, so in certain psychoses, other than the one under consideration, emotional disturbances occur which would not justify one in grouping these cases as types of hysterical insanity.

Dr. Woodman, in closing, said he thought Dr. Jacoby had touched upon an exceedingly important point in the ultimate relationship of these cases in calling attention to the fact that the neurologist regarded many of the somatic features of hysteria as distinct delusions. The speaker believed that in hysteria both the physical symptoms and such mental disturbances as were regarded as insane left a common basis in a characteristic thought disorder. He also agreed with what had been said regarding the long duration of these cases. He recalled one case where the symptoms persisted for three years before recovery took place, and there was another case in the hospital that had been there about three years. In other cases, however, the recovery had been very prompt.

In reply to Dr. Leszynsky, the speaker said that by slight contractions of the visual field he meant practically that the sight was limited to an area within 60 degrees. Some of these patients were examined by rough tests, and others with the perimeter, which it was impossible to employ in some instances. In others, only rough tests could be made.

Dr. Woodman said he did not wish to be understood as presenting the provisional classification of the cases he had reported in his paper as a classification of hysterical insanity. He simply used these headings as guide-posts to give some idea of where, among the many groups of insanities, we might look for the hysterical type.

On Flights of Ideas.—This paper was read by Dr. August Hoch, of Bloomingdale. After a review of various theories regarding this symptom it was pointed out that it is impossible to explain either the normal train of thought or that of flight of ideas otherwise than by the recognition of a force by which the train of thought is directed, a force which is active in the normal train of thought, but diminished or absent in flight of ideas. This force we call with Liepmann "attention," recognizing that this is a somewhat restricted use of the term. In this sense, then, flight of ideas is an attention disorder. Such a conception alone takes account of the symptom fully. Because a study of the cases shows us that the peculiarity of the train of thought, namely, its being constantly deflected into the side tracks, is not the only manifestation of the attention disorder, but that the latter has two components, viz.: an emissive and a receptive one. The emissive component, that which is usually termed flight of ideas, is best characterized by the statement that the train of thought follows the path of least resistance. It is not enough to say that it merely follows the laws of association, because emotional factors influence it strongly. The modifications which this emissive component may present may be produced, in addition to emotional factors, first, by the intellectual development of the patient, since with some persons logical trains of thought are more habitual than with others, and consequently some may represent a path of least resistance. Here may also be mentioned the observation that patients with pronounced flight of ideas may become much more coherent when they talk about subjects which are supplied to them or about subjects or incidents which made a special impression on them; secondly, by that which Krapelin has called thinking disorder, and which may be associated with the attention disorder. The modification through emotional influences is best shown in the cases in which the flight of ideas is held together, as it were, by a depressive emotion or by anger.

The receptive component shows itself in the inability on the part of the

patient to quickly combine simultaneous or successive data of observation into a conclusion, so far as this is an effort. Conclusions in regard to facts and situations which present themselves to such patients are not drawn from all the data, which are then balanced with former experiences, but merely from a few, while at the same time the subjective factor predominates; or, in other words, the conclusions follow the path of least resistance. As a result, the identity of persons is often mistaken, the grasp on the surroundings is faulty, and delusions are formed. The latter may be very stable, and indeed may dominate the clinical picture. The receptive component may also be recognized by tests (reading tests). The patients are made to read paragraphs of graded complexity and asked to give the gist. The recognition of this receptive component, which has never been sufficiently emphasized, explains, therefore, various secondary symptoms associated with more marked degrees of flight of ideas. And when, through certain modifications, the emissive component of the attention disorder is obscured, the analysis of the receptive component may be of great diagnostic value.

This sort of attention disorder is a common symptom in various psychoses. Deliria and senile dementia were mentioned as examples. In both of these conditions we may find trains of thought identical with flight, though less marked, and submerged, as it were, by the specific symptoms belonging to these states; namely, in the deliria, the constant tendency toward lower levels of consciousness; in senile dementia the diminished mental responsiveness, with its sequels. It may be added that both these conditions have been called attention disorders. But they are different from the attention disorder described here, and only give rise to it as an incidental manifestation. In its pure form, however, we find it in manic-depressive insanity, where it presents itself as an essentially dynamic disorder. Some of the points were illustrated by clinical descriptions.

Dr. Charles L. Dana said that Dr. Hoch's paper was a very clear and important contribution to this subject. He thought perhaps the author had laid too much stress upon the term "flight of ideas," as though that term represented some particular and definite psychical phenomenon which it was the duty of psychologists to analyze. Flight of ideas was, however, a characteristic syndrome, and the speaker's demonstration that it was essentially an attention disorder was very convincing.

Dr. Adolf Meyer said the recognition of the meaning of the flight of ideas as attention disorders was of great importance in the understanding of certain mental conditions. Without a realization of their nature, the diagnosis of such cases as the ones reported would be attended with considerable difficulty, especially in those instances where the existence and persistence of delusions might suggest otherwise a condition of grave character. That Aschaffenburg's explanation did not cover the ground was certain, yet it would seem that the motor factor in the production of alliterations need not be ruled out, as it no doubt helped to explain part of the effect of the attention disorders as the practically much more important side insisted upon by Dr. Hoch explained other results.

Dr. Fisher said that all thought required attention, and with disordered attention there was this rapid succession of ideas, or flight of ideas, to which Dr. Hoch had referred. The association of ideas made the succession rapid or slow, as the case might be. Certain ideas will call up others, depending on the knowledge or experience of the person along certain lines, and the flight of ideas is apt to be more rapid without the control of the will. When there is a lack of attention there is a lack of will power, and a rapid ebullition of ideas. On the receptive side, this is more or less the same. The person might receive a hundred impressions and, his attention not being fixed, he might not be able to put them in their proper relation or properly associate them because they did not remain

long enough in his consciousness. Without full consciousness there was never a true appreciation of what was perceived, and there was apt to be not only a succession of ideas, but an incoherence of ideas, because consciousness was not in control.

Dr. Smith Ely Jelliffe said that the points which Dr. Hoch had accented in his paper deserved more attention than they had been in the habit of receiving, at least from workers in psychiatry in this country. He felt that what Dr. Hoch had done was to point out that the disorders of the function of attention were capable of just as definite and distinct analyses as the anomalies in the less complex physical reactions of the body, and that a clearly outlined symptomatology was possible and might be pathogenic of essentially different psychic anomalies. He felt that there was need of greater precision in the study of these disorders of attention, both from the emissive and from the receptive side, as Dr. Hoch had already emphasized, and he said that in the study of drug action assistance might be derived in unraveling this faculty of attention, more particularly its disorders from both the emissive and the receptive sides; thus, the well-known action of belladonna on the emissive side and that of cannabis indica on the receptive side. In the latter, as is well-known, anomalies of attention are brought about which might be closely comparable from the standpoint of analogy, at least, with those spoken of by Dr. Hoch as occurring in forms of manic depressive insanity. It is not at all unusual to encounter in cannabis delirium the characteristic failure to recognize objects, and even more striking anomalies of mistaken identity and false judgment from defects on the receptive side of attention, and, finally, the development of hallucinatory and delusional states closely comparable to those spoken of in the discussion.

Dr. Woodman said he had hitherto been inclined to underestimate the importance of the receptive side of the flight of ideas. He mentioned a case of long-standing manic depressive insanity where the patient was able to talk well and coherently, but failed in the reading test. He was unable to explain a simple paragraph without interjecting his own ideas to the exclusion of those of the writer.

THE BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.

October 19, 1905.

The President, DR. MORTON PRINCE, in the Chair.

A Case of Cerebro-spinal Syphilis, with Operation.—Dr. Waterman said he wished to present a case to illustrate a principle which seemed to him an important one in conditions similar to the one he described.

The patient, a robust-looking man of forty, was seen in consultation on July 2, 1905. At that time he gave a history of having had pains in the abdomen for two months. These had been somewhat diffuse, but very severe, and he had consulted several physicians, who had made various diagnoses. During the past three weeks there had been progressive weakness of both legs and incomplete control of the bladder; the pains in the meantime becoming less severe.

Upon examination he was found to have a marked spastic paresis of both legs, and, though all movements could be made, he was unable to stand without support. There was marked diminution to the sense of touch and pin-prick everywhere below the level of the costal borders in the nipple lines, and absence of position sense of the toes and feet. The abdominal and cremasteric reflexes were absent, the knee-jerks were exaggerated, and there was ankle clonus and Babinski's reflex on both sides. Incontinence of urine was complete. The arms were not involved.

The pupils were equal, irregular in outline, but reacted well to light and accommodation.

Although venereal infection, and even exposure to it, were earnestly denied, a diagnosis of meningo-myelitis was made, and a vigorous anti-luetic treatment given. Inunctions were given daily, beginning with one-half dram of mercurial ointment, and the dose of potassium was rapidly increased to 300 gr. a day.

In spite of the treatment, the paralysis of both legs became complete in the course of the next three weeks, and sensation below the waist was absolutely lost.

Operation was then advised, but was put off for various reasons for three weeks or more, during which time the same treatment was persisted in, but with no improvement of symptoms.

On Aug. 3, 1905, Dr. Balch removed the laminae of the seventh and eighth dorsal vertebrae and opened the dura, exposing in the upper part of the field a normal appearing pia mater, while in the lower part there was an opaque, gelatinous infiltration of the pia-arachnoid extending downward and surrounding the nerve roots. A director was passed downward into the canal to free the tissue as much as possible. The dura was then brought together and the wound closed.

The mercury was now omitted, but the iodide was continued in 100 gr. doses three times a day. Much to their surprise, there was improvement in the sensation of the legs in 48 hours, and a few days later the patient was able to move the legs a little. Five weeks after the operation he could get about the ward with the aid of crutches and move the legs with considerable strength, although the spasticity was still great. He had also gained control of his bladder, and the pain had completely disappeared.

The sequence of events in this case would certainly support the views of those who believe cases of advanced and active syphilis of the cord and brain should have the immediate relief afforded by operation, to be followed by vigorous medical treatment.

In the days required for the iodide and mercury to begin to have effect, irreparable harm may be done to important structures through pressure and infiltration of tissue. Moreover, as this case seems to illustrate, iodides act more readily when pressure has been relieved by operation.

Women Nurses on Wards for Men in Hospitals for the Insane.—Abstract of Dr. Bancroft's paper. The desirability of women nurses on such wards was considered. The character of the ward and the class of men patients to whom such assignment could be made was taken up. The following classification was considered:

1. The hospital ward for the reception of recent and acute cases; practically an observation ward.
2. The hospital ward for the physically sick and infirm insane patients.
3. Wards for the quiet, chronic demented insane.
4. Wards for the various classes of the quiet chronic delusional insane. Many of these patients would possess varying degrees of intelligence: some would be bright, active and interested in games and the topics of the day; others less active, more secretive, and more or less demented.
5. Wards for the active and disturbed patients. Here will be found the acute and chronic maniac, paranoiacs with dangerous tendencies, and extremely destructive and untidy patients.
6. Wards for the convalescent and most intelligent insane.

It was considered that there was no question that women nurses could be employed to the greatest advantage in the hospital reception ward, the hospital ward for the physically infirm insane patient, and the wards for the convalescent and most intelligent insane.

The desirability of an admission hospital building with observation ward, examination room, electrical and hydrotherapeutic departments was considered. The advantage accruing from the placing of women nurses on such wards was discussed. The patients would receive better care and better nursing, the hospital idea could be more effectively realized with women nurses on such wards and the good effect and restraining influence of women nurses on both men patients and attendants would be most marked.

The exact method of carrying out the placing of women nurses on men's wards was discussed. It was considered better that women nurses should be entirely in charge of such wards, receiving such assistance from orderlies as is obviously necessary. The head nurse should be responsible for the entire management of the ward; should report directly to the medical officer and execute his orders and prescriptions. In this way the training school would prove of the utmost benefit to the hospital, for its nurses would be placed in charge of these wards.

The difficulty of securing good male attendants, which has constantly increased during the last few years was considered a strong reason why women trained nurses should be placed in these positions.

The manner in which this subject has been considered in Great Britain was referred to, and the arguments pro and con briefly reviewed. The preponderance of medical opinion in that country was largely in favor of the employment of women nurses as far, and to as great an extent as is practicable.

The chief objections to the employment of women nurses on men's wards would be the dangers likely to occur to women in such location; but with a proper selection and classification of patients, and by placing nurses on such wards as have been mentioned above, there can be little or no danger. So far experience has shown that men patients control themselves better in many ways through the presence of women on such wards than when there are only male attendants there.

Dr. Tuttle said that women nurses are employed in men's wards of the McLean Hospital. The practice was begun by Dr. Jelly about 28 years ago. The number was gradually increased, and for many years a nurse and ward-maid have been employed on each of the men's wards except one, which is that for the most excited patients.

The woman nurse, with her assistant, is responsible for the domestic affairs of the ward. She has charge of the dining and serving-room, and the supervision of the housekeeping generally. She makes special articles of diet for sick patients, looks after the laundry, makes little repairs to clothing, sees that the list of clothing for each patient corresponds with what is actually on hand, assists in the nursing of patients confined to their beds, and in entertaining the men, with some of whom she walks, drives and plays golf.

The advantages of such an arrangement can scarcely be over-estimated. Among them may be mentioned the better serving of food, economy of hospital property, a better appearance and more domestic atmosphere of the ward, which contributes to the comfort and contentment of the patient, and, what is most important, the prevention of a tendency to degenerate in conduct, dress and conversation which is almost certain to result when men associate without the presence of women.

A man has charge of the ward, and is immediately responsible for the personal care of the patients. This seems to be a better arrangement than giving the woman entire charge. She is responsible for her part of the work, and her criticisms of the assistant male nurses are made through the head male nurse to the supervisor. This division of service has existed from the beginning, and has been found to be satisfactory in practice. Dr. Tuttle would hesitate to deprive the man of the place of head-nurse. The career of the male nurse thus far has been limited, and this seems to be one reason why the men who ordinarily are available as nurses in hospitals for the insane are so unsatisfactory. With the most liberal employment of women possible in the charge of male wards, we still must

employ many men in the care of insane men, and in Dr. Tuttle's judgment satisfactory service will only be attained by giving the men an education equal to that of the women. The field of work for the male nurse is chiefly in hospitals for the insane, a much more limited service in general hospitals, and the care of insane men in their homes. This latter field has broadened considerably in the last 15 or 20 years, and there probably would be a still greater demand if an adequate, satisfactory and not too expensive supply were available. The remedy for the difficulty which the reader has mentioned would be to establish well-equipped training schools for the men as well as for the women, and try to enlarge their sphere of usefulness rather than limit it by appointing women over them. With ordinary common sense, an equally good education, a kindly nature and a disposition to respect authority and carry out instructions, a man rather than a woman would be the appropriate head of a male ward in a hospital for the insane, where the conditions are so different from those in a general hospital.

Dr. Blumer mentioned gratifying results following the employment of female nurses in male wards at the Utica State Hospital, as well as at Butler Hospital, Providence. He believed that the best success would follow an arrangement of the service whereby the female nurse should not be subject in her work to the higher authority of a male nurse. That way lay friction. Recent experience had convinced him that the field might be further cultivated, and that in private hospitals especially there were some male patients who might with perfect propriety be taken out walking singly by female nurses. In view of the growing difficulty of getting desirable young men for our hospitals, it was well to avail one's-self of all the possibilities of performance that inhere in the service of female nurses.

Dr. Cowles said that Dr. Bancroft had presented so many points of interest in his very complete discussion of his subject that it is difficult to choose one to which anything can be added. He is undoubtedly right in his expectation of the usefulness of women nurses for insane men in his hospital wards. It works well to put women in sole charge of some such wards, with men orderlies if needed, as Dr. Clouston did in his special infirmary wards to improve the "body-nursing" of the sick insane more than 25 years ago. But it is not best nor necessary to be bound by that method of organization because it is the rule in general hospitals. There the patients are practically bed-cases, requiring body-nursing for a limited time. Insane patients, on the contrary, are long resident, and, being comparatively well in body, require little of such nursing, but much can be done for their mutual comfort and well-being; the domestic duties of hospital life can be best conducted by women, including its economies. It should be possible to do what one wishes for his patients, and upon that depends the placing of a woman in sole charge or dividing the duty with a man nurse in joint control; each can do some things better than the other in some cases.

The value of women nurses, and of associated control, have been proved by experience at the McLean Hospital. Dr. Jelly employed there a man and wife in charge of one house, and a trained nurse in a common ward in 1877; but the result of Dr. Cowles' first efforts in 1880 to introduce methods there from the newly-founded training schools of the Boston City Hospital showed after many trials that general hospital trained nurses did not do well in "mental nursing." It suited the conditions better in the men's wards to work out the principle of customary family life by putting in charge an experienced woman from the women's wards as mistress of the ward household; she was given control of everything included in a woman's care of the family life. This meant attention to the sick, and to the social life as well as the ordinary domestic duties. In all this she had the aid of a ward-maid, and the men nurses in the ward were made subject to her directions in all that pertained to women's work.

The duty of a man nurse in coördinate charge was to aid the ward mistress by attending to matters of discipline of patients, and duties with them appropriate for men, and by requiring deference and obedience to her of the assistant men nurses. To him was assigned also the special charge of all outside business of the ward with the central offices and the care of the patients in respect to gymnasium exercise and recreations, outdoor games, excursions, etc. Such an organization is essential to patients of the private class, because some of the men assistants act as private nurses and companions. Under such circumstances the hospital requirements can receive proper attention, and full scope is given for all that women can do; but the institution aspects of the situation are softened by making the most of the social opportunities, with much amelioration, for example, of the monotony of winter evenings. All of this being entirely in harmony with home life in common experience, the spirit of it is borne in upon all concerned, with little teaching, and, being nearest to the natural way, life moves along in its daily order with a minimum of friction. This method, beginning in 1880, was immediately successful and continued so; it was extended until in later years all but one of the men's wards had trained women nurses and assistant maids. Individual shortcomings in either men or women were so rare as to cause no question of the value of the method, and was easily remedied; when well-meaning and properly instructed, they do what is expected of them, success being assured by the correctness of the principle of organization.

Different classes and groupings of patients are certainly best served by different arrangements of the nursing service. Dr. Cowles' belief is that we should use what best suits the circumstances in these matters without being bound by any hard and fast rule.

Dr. Lane said that all who are familiar with the conditions of our public hospitals are agreed that the standard of male nurses is far below what it has been. It is probable that we can never get enough good men to do all the work in the men's ward in the best way, and he was heartily in favor of putting the women nurses in the men's wards. This summer he saw the experiment tried of placing a woman nurse with an insane man who was cared for at home. Her presence was a moral restraint, so that while she was about he ceased from profanity or objectionable language.

The practical difficulty with placing women on the men's wards in public institutions is this: Many of the wards are supplied with the minimum number of male attendants. It is impossible or unsafe to replace this limited number with women. The women in many wards must be additional, and this means an increased expense. In time, Dr. Lane believed, it would work out so as to be little really extra expense, but the initial step would be an expense that boards hesitate to incur. On the other hand, something must be done at once to make the position of the male nurse more attractive. There are large numbers of men willing to work for moderate wages, if the conditions of living are not irksome. The hospital nurse should have more freedom during hours off duty. As it is now, he lives constantly under rules and restrictions that make it very distasteful to the average man.

Dr. Boland emphasized Dr. Bancroft's point about the reassuring effect of the presence of women nurses in male wards for insane patients on the visiting relatives of such patients. Anything that helps to minimize the distrust and prejudice still present in the minds of many against insane hospitals is a step gained.

Dr. Mitchell said that in the past, women nurses had been employed in the wards at the Danvers Insane Hospital, and had rendered very satisfactory service. He thought, however, that the work there could not be improved by placing women in charge of the ward where their services could be utilized, but that the responsibility of the wards should fall upon a male nurse. Good men could be kept in the hospital service, if they were

encouraged by giving them responsibility and proportionate increase of pay dependent upon their ability and length of service.

Dr. Owen Copp mentioned an extreme illustration of this work he saw several years ago at the Sterling District Asylum at Larbert, Scotland, carried on under the able direction of Dr. Robertson. One is surprised and almost incredulous at his success, and the extent to which he has extended the application of this principle.

This is one of the large Scotch pauper asylums, caring for about 700 patients at that time, who were classified in three main groups of buildings separated from each other by a space of several hundred feet.

In the first group were about 350 (50 per cent.) chronic patients, who were all quiet, able-bodied workers in the various departments of the asylum, its workshops and farm. All the men patients were in charge of male attendants because the latter were needed to direct and assist in various occupations. The second group provided for about 250 (35 per cent.) patients, who were all chronic cases of both sexes and belonged to the infirmary and custodial classes. Here women nurses were in charge of all the male patients except about 35 in a single ward, where there were three male attendants. The third group received all new patients, and had a capacity of about 120 (15 per cent.). Here again, all male patients were in charge of women nurses, with the exception of a single ward for about 30 men in charge of male attendants.

It seemed to Dr. Copp that Dr. Robertson's success was attributable to his fine discrimination in the classification and grouping of his patients. He seemed to regard it as important not to place women nurses on the same ward with men nurses, and not to place women nurses under the supervision of male supervisors. The whole male department was under the supervision of a matron; there was no male supervisor. Every male attendant was subordinate to this matron. She was aided by assistant matrons. These matrons were refined, educated, thoroughly trained women, well paid, and working on the plane of officers.

Dr. Robertson found the system economical, inasmuch as it was not necessary to pay women nurses on men's wards more than those on corresponding women's wards. This saving of expense enabled him to largely increase his night service. Dr. Copp did not know of any large public hospital for the insane which has so large a night service of nurses. They numbered one-half as many as the day nurses. It seems to him that Dr. Robertson's experience is exceptional, and is an example of what clear conviction and persistent interest can accomplish.

Dr. Copp met with another surprise at Woodilee, one of the Glasgow District Asylums, which had nearly a thousand patients. All new patients of both sexes were received in reception pavilions. These were entirely in charge of women. The régime had been recently established—only a few months, he thought. He was told that up to that time no male attendant had been required, and that no outside assistance had been necessary in caring for the men patients.

The assistant physician said that the influence of the women nurses over the disturbed men patients was quite astonishing to him. He said that the assistance of men would be called in at any time if needed. He did not expect this experience to continue for any great length of time, and one could hardly conceive that it could. It is, however, suggestive of possibilities in this direction.

Dr. Hall said it is, perhaps, needless at this point to emphasize the professional value of a woman over a man in administering a given ward for men patients, yet he hoped he might be pardoned in attempting an additional cogent reason for the preference as a matter of record in a full discussion upon an important subject.

Among men nurses acquirements by training are, as noted by the reader and members who have taken part in the discussion, inferior in

degree to those attained by women. The latter are far more proficient than the former in appreciating instruction in symptomatology, both in the field of psychiatry and neurology. As a result, the ward records in nearly all cases show a greater value when made by the woman nurse as compared with those of the opposite sex.

Apropos of the question under discussion, "Shall the woman nurse be in charge?" Dr. Hall made the inference, namely, the nurse having superior acquirements should not be in an inferior position in ward administration.

Periscope

Archiv fuer Psychiatrie und Nervenkrankheiten

(Vol. 39, Part 3.)

1. Expert Medical Opinion Concerning the Health of the Laborer. B. EDUARD HITZIG.
2. Peripheral and Central Eye Muscle Paralysis. KINICHI NAKA.
3. The Treatment of Aphasia. FR. MOHR.
4. On the Theory of Cortical Vision. ERWIN NIESSL V. MAYENDORF.
5. Mental Disturbances in Arteriosclerosis and Their Relation to the Mental Diseases of Old Age (Conclusion). BUCHHOLZ.
6. The Eyes and Epilepsy. SCHOEN and M. THOREY.
7. The Significance of Acetonuria with Special Reference to the Presence of Acetone in Mental and Nervous Disease. J. HOPPE.
8. Concerning the Penal Code. Sec. 176. HERMANN KORNFIELD.
9. Care of the Insane in England and Scotland. E. MEYER.
10. A Further Finding in a Case of Family Cerebellar Ataxia. M. NONNE.
11. Hystero-epilepsy. PAUL STEFFENS.
12. Functional Contracture of the Neck Muscles. KNAPP.
13. Propositions Concerning the Judicial Treatment of Accountable Degenerates. C. MOELL.

1. *Health of the Laborer.*—Hitzig discusses at length a case of accident and proper methods of examination in conditions of traumatic neurosis. The conclusion is reached that the only true method for the discovery of and proper judgment regarding simulation consists in the repeated scientific applications of available clinical methods of examination in the individual case. In general, the article discusses in an interesting way the well-worn subject of the neuroses of traumatic origin.

2. *Eye Muscle Paralysis.*—Kinichi Naka discusses the findings in a case of peripheral paralysis in tuberculous meningitis. The clinical course was unusual in the suddenness of the onset, accompanied in the later stages of the affection by a paralysis of the oculomotor nerve, with death on the eighth day. At no time was there paralysis of extremities or disturbances of sensibility. Anatomically a high degree of tuberculous meningitis was found, with a marked involvement of all the eye muscle nerves at their points of exit, with slight hemorrhage in the region of the oculomotor nerve and degeneration of the oculomotor and acoustic groups. Attention is drawn to the difficulty of diagnosis in the case because of its rapid onset. A second case was reported of nuclear paralysis in a case of dementia paralytica of the tabetic type. In connection with this case primary atrophy of the ganglion cells was found. There is also a discussion of anatomical matters relating to the motor nerves of the eye.

3. *Aphasia.*—In a detailed article Mohr describes methods of training aphasics, basing his ideas on a recognition of the highly complex character even of the simplest acts of speech and upon the fact that speech must be regarded as a function closely bound up with the entire psychic activity. It therefore becomes necessary to regard the entire mental life of the aphasic. It is desirable to begin with the simplest possible exercises, in order that the patient may recognize progress. It is furthermore desirable to give patients words and sentences which recall interesting experiences; and finally, it is important to insist that the patient lead as moral

a life as possible and strive to express his views and feelings. It is urged that the physician should himself undertake this instruction and, if possible, continue it to the end. Later, it is possible to accomplish excellent results through a trained teacher, but the patient should not too soon be left to his own devices.

4. *Cortical Vision*.—On the basis of a careful study of the theory of cortical vision, Mayendorf reaches in part the following conclusions: The entrance of the central visual tract into the cortex of the occipital lobe takes place altogether in compact bundles; the cortical visual sphere is not a sense organ according to its specific structure. It is, like other parts of the cortex, an association mechanism which permits of optic impressions if conveyed to it preformed from the periphery. The same cell-complex stimulated through an association bundle from another source produces meaningless optical impressions. If an established cell-complex is aroused through the projection bundle, then by the mechanism of primary identification (Wernicke) comes the secondary recognition of an object. Through the stimulation of the same cell-complex over the association system optical memories become active. The macular bundle of the optic nerve has also separate representation in the optic radiation and those cortical areas which stand in relation with it are to be regarded as the **macular visual cortex**.

5. *Arteriosclerosis*.—In this paper Buchholz attempts to fill out our knowledge of arteriosclerosis by detailed histories of patients and minute anatomical investigations. Recognizing the fact that in most of the patients there is a large variety of pathological processes, it becomes necessary as far as possible to determine types of the disease. Few of the cases present simple, typical disease pictures, but in most cases, in addition to a series of symptoms characteristic of this or that group of arteriosclerotic processes, other conditions of this disease are to be observed. Binswanger and Alzheimer have drawn attention to a somewhat characteristic type of arteriosclerotic brain degeneration, and it remains to fill the gaps in our knowledge of the less characteristic forms. Buchholz's paper concerns itself with this latter object.

6. *Eyes and Epilepsy*.—Schoen and Thorey offer an exhaustive study on the condition of the eyes in epileptics in two institutions. The assertion is made at the outset that no absolutely thorough examination of the eyes in this class of patients has hitherto been made. This they have set themselves to do in the cases at their disposal. As a result of their studies on many hundred patients they found an exceptionally high per cent. of ocular defects. No treatment has yet been undertaken, and it is asserted that the complete carrying out of the necessary treatment is a matter of the most extreme difficulty. In general, they lean toward the view that the condition of the eyes should be seriously considered in relation to the disease, but they are far from asserting, in the present state of our knowledge, that ocular disturbances are the cause of epilepsy. They are, however, of the opinion that all cases should be carefully examined in this regard and, if possible, after the first attack the condition of the ocular mechanism should be thoroughly investigated.

7. *Acetonuria*.—This paper is a careful study of the significance of acetone in relation to certain disorders of the nervous system. During five years at the institution with which Hoppe is connected as chief physician, systematic examinations relating to acetone in the urine of five hundred epileptics and mental patients has been made. In three hundred and twenty-five epileptics acetone was found in 8.5 per cent. of the patients, and especially in status epilepticus and persistent confusional states. Oftener than in epileptics acetone was found in those suffering from acute psychoses, and in these cases chiefly in patients suffering from depression with reduced ingestion of food. Acetone was not once found among thirty-eight idiots and eight patients with chorea. It was seldom found

in general paralysis, and when found, during a paralytic attack. The paper contains tables and an elaborate bibliography of 144 references.

8. *Penal Code*.—Kornfeld discusses in a brief article certain questions regarding the working of the penal code, which has small interest to readers outside of Germany.

9. *Care of Insane*.—Meyer gives in detail the working of the laws for the care of the insane in England and Scotland, and finds in them and in the system generally much of interest to German psychiatry. The method of construction of asylums is also given, and matters relating to the family care of the insane. Meyer returned from his journey in Scotland and England enthusiastic over their methods, and with the conviction that the general methods there in vogue are worthy of the most careful scrutiny by those interested in the same subject in Germany.

10. *Family Cerebellar Ataxia*.—On the basis of further anatomical finding in a case of family cerebellar ataxia Nonne discusses the justification of the separation of Friedreich's disease into a spinal and cerebellar form, together with a clinical contribution to the congenital form of cerebellar ataxia and to so-called acute ataxia. Following an historical summary of the disease in question, he gives the autopsy findings in the second of three cases which he first investigated and published in 1894. The only anomaly was a diminution in the size of those parts of the brain developing from the fore and mid-brain and an exceptional diminution in the size of the cerebellum, whereas the oblongata was practically of normal size and the spinal cord wholly normal. The microscopic examination was of less significance. The case, according to Nonne, proves that the pure clinical picture of hereditary cerebellar ataxia may be produced solely through an abnormal smallness of the cerebellum; secondly, that the condition of the cerebellum is the essential lesion; and thirdly, referring to a previous case, that in the same family anatomical variation in the pathological conditions may be present with the same clinical course. The paper further discusses the transitional form and certain pathological conditions which may give rise to somewhat similar conditions. A good bibliography is appended.

11. *Hystero-epilepsy*.—Steffens is of the opinion that the underlying character of hysteria and epilepsy is not essentially different, but that the same causes appear in both, only in different form and varying intensity and persistence. It is, therefore, not remarkable that he regards a certain condition in which hysteria and epilepsy coexist as a definite disease. With this significance he admits the terms hystero-epilepsy, not thereby implying a third disease. Hystero-epilepsy is a psycho-neurosis, and belongs in the broadest sense to the degenerative diseases. In general, the article calls attention to the close relationships and apparently transitional forms between hysteria and epilepsy, and is a useful, although a somewhat theoretical, discussion of this subject.

12. *Contracture of Neck Muscles*.—In this paper, on the basis of a number of cases, Knapp discusses the question of the functional contractures of the neck muscles. He confines himself to a consideration of tonic spasms. The whole question of torticollis is discussed, with diagnosis and treatment. On the therapeutic side he considers that suggestion in the broad sense is alone of use, and by this means, at times with the use of electricity or massage, success may be attained.

13. *Accountable Degenerates*.—Moeli discusses in this paper in detailed fashion the difficult questions involved in the proper estimation of persons in a measure irresponsible for their actions, both in relation to law and to medicine. The importance of the careful study of the individual case, of his relation, on the one hand, to the criminal classes, and on the other to those which include simply the irresponsible, together with the proper treatment of the partially irresponsible, is discussed at length.

E. W. TAYLOR (Boston.)

Psychiatrisch-Neurologische Wochenschrift

(No. 8, May 20, 1905.)

1. The Etiology of Dementia Præcox. GREGOR STEINER.

1. *Etiology of Dementia Præcox.*—The author, after outlining Kraepelin's views on the subject, suggests the possibility that luetic infection may be an important etiological factor. In twenty-five cases of dementia præcox four gave a certain history of specific infection. If subsequent investigation should prove this relationship it would associate general paresis with dementia præcox, with which it has already many points in common.

(No. 9, May 27, 1905.)

1. The Question of a Medical Commission in the Care of Insane, Epileptics and Idiots. H. E. SCHWABE.

Medical Commission.—A paper dealing with the legal questions involved in the duties of a commission, and having no clinical interest.

(No. 10, June 3, 1905.)

1. The "Not Insane" in the Prussian Asylum Statistics. GRUNAU.

1. *"Not Insane" in Prussia.*—An article having only local interest, being a discussion of the bearing of the number not insane upon the percentage of recoveries in Prussian institutions, where it seems they were included in the total population and then added in with those discharged recovered.

(No. 11, June 10, 1905.)

1. The Parisian Opinion of Princess Louise of Coburg.

1. *Princess Louise.*—The opinion of Drs. Dubrisson and Magnan as to whether she should be confined in an institution and as to her sanity. They concluded her to be sane and not to require confinement.

(No. 12, June 17, 1905.)

1. The Evolution of German Psychiatry in the Beginning of the Nineteenth Century. MÖUKEMÖLLER.

1. *German Psychiatry.*—An article of only historic interest. (Continued.)

(No. 13, June 24, 1905.)

1. *German Psychiatry.*—(Continued.)

(No. 14, July 1, 1905.)

1. *German Psychiatry.*—(Continued.)

(No. 15, July 8, 1905.)

1. Opinion on the Capacity to testify of the Weak-minded. FRITZ HOPPE.
2. Contribution to "No Restraint." KERRIS.

3. The Evolution of German Psychiatry in the Beginning of the Nineteenth Century. MÖUKEMÖLLER.

1. *Testimony of Weak-minded.*—A paper of purely legal bearing.

2. *"No Restraint."*—A short paper in which the author discusses the influences of the environment of a modern hospital for the insane, the nurses, a more general understanding of insanity, and the like, that has created an atmosphere which makes restraint unnecessary.

3. *German Psychiatry.*—(Concluded.)

WHITE.

Brain

(Vol. 27, 1904, No. 108, Winter, 1904.)

1. On the Spinal Cord Degenerations in Anemia. J. MICHELL CLARKE.

2. System Lesions of the Posterior Columns in General Paralysis, and their Bearing on the Point of Origin of Tabes Dorsalis. DAVID ORR and R. G. ROWS.

3. False Localizing Signs of Intracranial Tumor. JAMES COLLIER.

4. A Study of the Emotions. W. H. B. STODDART.

5. Symptomatology of Cerebellar Tumors. A Study of Forty Cases. J. GRAINGER STEWART.

1. *Spinal Cord Degenerations in Anemia*.—The author speaks of the unsatisfactory state of the present-day knowledge of the relationship of anemia to the degenerations of the spinal cord as comprised under well-known clinical groups. He reports the history of four patients with autopsy findings and the microscopical lesions observed. His series of cases showed that the spinal degenerations which occur as a secondary change in profound anemia begin in the posterior columns, first in the cervical and upper dorsal regions of the cord. The most striking clinical features are paresthesiæ of various kinds, such as numbness, tingling, feelings of pricking, or of pins and needles, first appearing in the arms and legs. Later the hand and forearms may be affected, when a common complaint is that numbness or deadness of the fingers renders fine movements difficult. These paresthesiæ vary much in intensity during the course of the illness. Objective disturbance of sensation is not marked, but in the late stages may consist of some deficient appreciation of all forms of sensation over the lower extremities. After these sensory symptoms weakness in the legs may follow, often in the sense that they feel heavy, and later still both arms and legs may be weak. A frequent and often troublesome symptom is twitching of the muscles, especially of the legs, at night. The deep reflexes are present, ankle clonus is not obtained, and the plantar reflex, flexor in type, is sometimes difficult to get. The knee-jerk was absent toward the end of life in Case II, but he could only be examined as he lay in bed. There is no ataxy and no incontinence of urine. The cases which he described form a fairly distinct group, and the changes in the cord occur in such a way as to show that they result from anemia, and from forms of anemia due to blood destruction. Though pernicious anemia is one form that causes these cord lesions, it is by no means the only one. He is here taking pernicious anemia in the ordinary sense of the term, though there is so much difference of opinion as to what actually constitutes pernicious anemia that it is difficult to avoid confusion. In favor of the point that it is only when anemia is due to blood destruction that these cord changes follow is the striking fact that they are not seen in chlorosis, of however long standing. A possible view of the pathology of these cases seems to the author to be that of parenchymatous degeneration due to some toxin, possibly set free in the course of a pathological blood destruction and, therefore, hemolytic in origin. More extended observations on the blood and on the precise character of the anemia would tend to elucidate the nature of the process. In this particular group the cord changes often follow on so long a period of anemia that it is difficult to suppose that the lesion is other than a secondary one, although it is possible that the cord changes might be due to the continued action of the same cause that has already produced anemia, just as in those cases of cord degeneration and anemia described by Dr. R. Russell and Dr. J. Taylor they suppose that both conditions are due to the same toxin.

Without laying undue stress on the anatomical characters of these cases, it seems to the author that there are good grounds, both clinical and pathological, for separating them from similar forms of degeneration of the cord, and that these are: (1) The presence of decided or severe anemia as the first, or sometimes the only, sign of illness; preceding any evidence of spinal cord lesion. (2) Clinically, symptoms and signs of disease of the cord are never very pronounced, and they may be absent, though possibly in most cases are present when looked for. (3) Anatomically, the lesion is generally confined to the posterior columns, and if it affects the lateral columns only, does so to a limited extent. (4) It differs in extent and distribution from sub-acute combined sclerosis or diffuse degeneration of the cord in the following ways, according as the disease

in the latter case is slight or severe. (a) In the milder cases of diffuse degeneration the degenerations are more precisely limited to the neuron systems of the cords; thus, in two cases under his own observation the columns of Goll were diseased from the lumbar region upward to the medulla, and the crossed pyramidal and dorsal cerebellar tracts were similarly affected, whereas in (b) the more severe cases the degeneration is both more extensive than in the cases considered in this paper, and also affects the periphery of the cord most, and appears to spread thence inward at any rate in the lateral and anterior columns. On the other hand, it must be admitted that the microscopical details of the degeneration process appear to be similar in both groups, and further that there are cases which occupy an intermediate position, in which the cord changes are associated with profound anemia, and are also extensive in distribution. It seems to the author that the chief difficulty lies in the nature of these intermediate cases.

In conclusion, although the evidence is not sufficient for a final classification, the author thinks that a step in advance might be made by separating into two distinct groups: (1) The cases of pronounced anemia with lesions in the spinal cord of the character described in this paper, and with slight or absent clinical features of the disease; and (2) those of subacute combined degeneration of the cord in which there is no anemia, or if it is present it is late, and consecutive to the appearance of symptoms of cord disease, and in which also the pathological changes in the cord are more extensive and their symptoms pronounced, following more or less closely the course outlined by Drs. Russell, Batten and Collier. In support of this division it may be mentioned that in fifty cases of the latter kind collected by Drs. Putnam and Taylor, in only seven was there decided anemia. Those cases which seem to combine the features of the two groups, in presenting both profound anemia and widespread cord degeneration, the author would propose to leave provisionally in a class by themselves pending further investigation.

2. *Posterior Column Degeneration in General Paresis.*—The authors contribute a lengthy study on fiber changes found in the columns of Goll and Burdach in paresis, and make some interesting comments on the relation of that disease to tabes on the score of these posterior degenerations. In the majority of cases of paresis there was no posterior column sclerosis, but in those in which degeneration was found it was characteristic that it always began in one place, *i. e.*, at the entrance of the posterior roots into the cord, and from that spot spread to the fiber terminations. The authors say with reference to the pathological picture that there is (1) degeneration of the internal division of the sensory roots in their intramedullary path, commencing at the point of entrance into the cord and following the usual anatomical course of the fibers of the cord. (2) The collaterals and terminals of the sensory system, which pass into the gray matter, share in the degenerative process. (3) Complete integrity of the outer division of the sensory root, Lissauer's tract. (4) The long fibers which were affected in the root-entry zone in the lumbar region could be followed into Goll's column in the cervical region.

Obersteiner's ring was the site of election of the attack. Here, as is well known, the neurilemma sheath is lost, and the hypothesis is suggested that the bare nerve fiber is subjected to the action of a toxin-laden lymph stream which flows toward the cord in the perineural sheath. The poisoning results in a primary degeneration of the nerve fiber and a consecutive atrophy of the myeline sheath—the axis cylinder may ultimately give way secondarily, the fiber degenerating from the point of injury centrifugally to its termination. The authors contrast their view with that of Nageotte, who assumes Wallerian degenerative process to be fundamental in posterior column sclerosis. Tabes is a system disease, they conclude, which begins as a parenchymatous degeneration of the sensory protoneurons, starting at the point where the neurilemma is lost.

3. *False Localizing Signs of Intracranial Tumor.*—Dr. Collier has based his paper on the study of 161 cases of intracranial tumor that have come to autopsy in the National Hospital in the ten years between 1894 and 1904. The author seeks to show: (1) That local signs appearing late in the course of cranial tumor, where general signs have pre-existed, are often of false portent. (2) The relative frequency with which local signs have been due in this series of cases to the presence of vascular lesions, meningitis, hydrocephalus, local spreading edema of the brain, secondary deposits of new growth, and posterior degeneration. (3) That the absence of usually accepted local signs during the early days of illness in intracranial tumor is in itself a most important localizing indication, confining the disease to the supratentorial region. (4) That true localizing signs at one time present may later become concealed or undemonstrable, owing to the development of other signs, and that in cases which come under observation for the first time late in the disease diagnosis may be difficult, erroneous, or impossible.

The relative frequency with which the different parts of the brain were the seat of new growth in this series of cases was as follows: Frontal 24, central 20, parietal 7, occipital 3, temporo-sphenoidal 12, centrum ovale 17, basal ganglia 14, brain stem and pons 22, cerebellum 26, other situations 16.

As illustrative of what he would convey as late localizing signs, he appends a summary of a history wherein a late involvement of the left sixth, seventh and eighth cranial nerves, after fifteen months of general symptoms, was due to the pressure backward of a glioma in the left pre-frontal region. Localizing Jacksonian convulsions in another case were due to general ventricular distention. False localizing signs were found in 12.5 per cent. of all his cases. In two instances the false signs were due to hemorrhage and thrombosis respectively; in the rest the false signs were to be attributed to the indirect intracranial results of intracranial new growths. They were met with in 13 per cent. of the supratentorial tumors, and only twice in fifty-four cases of subtentorial tumors. He reports the following localizing signs, occurring either singly or in combination, as false signs: Paralysis of cranial nerves; olfactory (once), hemianopsia (two cases), third (two cases), fifth (two cases), sixth (twelve cases), seventh (two cases), eighth (two cases); ninth, tenth and twelfth were not indirectly affected.

He submits, therefore, that the occurrence of local convulsion of hemiplegia and of general convulsion, when presenting for the first time, long after the general signs of intracranial growth have appeared, is to be disregarded as a localizing sign. It is the result of secondary hydrocephalus, and the latter may result no matter where the growth may be situated within the skull. Slight bilateral spasticity is not infrequently an indication of the existence of such ventricular distension. The author further considers the symptoms due to other lesions co-existing with a neoplasm, such as meningitis, vascular lesions, local spreading edema. The paper requires reading in full to be fully appreciated.

4. *A Study of the Emotions.*—Dr. Stoddart in this paper, in first speaking of the physical basis of the emotions, submits two propositions as capable of demonstration: (1) That an emotion is a sensation-complex, its component sensations being entirely derived from a complex, usually involuntary, motor response to a percept or idea of some situation or incident. (2) That the motor paths subserving the function of this involuntary response are those of the primitive nervous system, viz.: the cortico-rubral system of fibers and the rubro-spinal tract. He derives certain proof from the use of the plethysmograph, the sphymograph, pneumograph, dynamometer and automatograph, and categorically states his conclusions. With reference to the second point he summarizes the neural process which takes place when an emotion occurs as follows: Starting from the stage at which

a sensation is registered in one of the projection areas, or a percept or idea formed in one of the association areas of the cortex, an impulse is transmitted to the red nucleus by way of the cortico-rubral fibers, thence to the large motor cells of the lowest level by way of Monakow's rubro-spinal (and presumably rubro-bulbar) fibers of the pristine motor system, and thence to the muscles of expression. Contraction of these muscles upon their spindles effects the transmission of the muscle-sensations to the cortex by way of the ordinary sensory paths; and it is the particular combination of these sensations among themselves and their vaso-motor sensations which determine the given affective or emotional tone. In a second section he deals with the pathology of the emotions, discussing superficially the excess of emotional reaction and deficiency of emotional reaction, summarizing his conclusions as follows: Excess or defect of emotional reaction may be dependent upon excess or defect of sensation, or upon excess or defect of perception. Excess of emotional reaction may also depend upon an abnormal tendency of motor impulses to be transmitted via the pristine emotion-arousing tracts of the nervous system, and defect of emotional reaction may further be due to fixation of emotion-arousing musculature.

5. *Cerebellar Tumors. Symptomatology.*—Drs. Stewart and Holmes, in analyzing forty cases of cerebellar tumor, have contributed a small monograph on the subject. In twenty-two instances the autopsical report was utilized in the analysis. They have divided their study into two sections, dealing with (a) tumors within and limited to the substance of the cerebellum, and (b) those in which the growth was extracerebellar, or those tumors lying in the posterior cranial fossa in the angle between the pons varolii and the cerebellum, compressing but not invading either. In speaking of the general symptoms attention is called to headache, vomiting and optic neuritis. The *headache* is usually present early and constantly in both types of tumor. It is similar in character to the headache of other intracranial growths, but its situation may be suggestive. In intracerebellar growths the pain is most intense occipitally and frequently circumscribes for long periods, or it may radiate down the back of the neck or between the shoulders. Frontal and retro-ocular headaches are next most frequent. In extracerebellar tumors the pain is almost always occipital and may radiate down the neck. The headaches are apt to be extremely severe. *Vomiting* is almost invariably present in some stage of cerebellar and extracerebellar tumors. *Optic neuritis* is a constant accompaniment of intracerebellar neoplasm. It comes on early and is often intense, and disproportionately so in character. Transient blinding attacks are common. *Vertigo* is a constant symptom in both types, particularly in the extracerebellar forms. It is apt to be transient, a "giddy feeling" being characteristic of one type. There is often as another type a sense of displacement of external objects from the site of the lesion. Thus, if tumors are on the left side there is an apparent movement of objects from left to right. In intracerebellar tumors the subjective rotation of self was always from the side of the lesion to the healthy side, whereas in extracerebellar tumors the reverse condition was present. The authors regard this symptom of much diagnostic import. *Deafness* was present in practically all extracerebellar tumors and on the side of the tumor. It was a negligible factor in the other type. *Tinnitus* is fairly common in extracerebellar tumors, and is in the corresponding ear. Cranial nerve symptoms are common. The majority of cases of both types develop sometimes varying degrees of rectus palsy on the side of the disease. Squint and diplopia are often transitory, but are liable to recur, and more often present in extracerebellar tumors. Bilateral external rectus paresis is especially met with in tumors of the middle lobe of the cerebellum. *Pupils* are not markedly influenced, the optic neuritis influence being paramount. The third and fourth nerves are almost invariably in-

tact. Nystagmus is a constant symptom. Slow, deliberate jerking movements to the side of the lesion in looking in that direction, with gradual recession of the eye to the middle plane, are characteristic. Lateral and vertical movements show the nystagmus most markedly. *Facial paralysis* is not infrequent, chiefly due to extracerebellar pressure.

MOTOR SYMPTOMS.—Paresis in the limbs of the same side as the tumor is not infrequent. There is usually no accompanying organic rigidity. The trunk muscles particularly are involved. The extracerebellar tumors rarely give rise to such definite homolateral paresis, but may cause symptoms more indicative of the hemiplegic type from cortico-pontine pressure. *Atony* of the muscles is common. They are frequently flaccid and limp. *Ataxia*, a classical symptom, is a true dysmetria, the agnostic and antagonistic being incorrectly opposed or misjudged. It is a central ataxia, rather than a peripheral one. Ataxia is not increased on loss of vision. It is an ataxia the direct antithesis of an intention tremor, the muscles becoming firmer as the object is gained.

In cases of chronic course, or where the lesion has become latent, the ataxy is, as a rule, less definite. This is especially so when the condition has become complicated by hydrocephalus; then it may be less typical, and approximate to the intention-tremor type characteristic of disseminated sclerosis. This seems to occur most frequently in tumors involving the vermis. In disease of one lateral lobe the incoördination is typically present only in the homolateral limbs, but not infrequently there is in addition some degree of ataxy in the opposite limbs, though always less in degree. When the tumor is in the vermis, or extends into both lateral lobes, the incoördination is bilateral, but greater in the limbs of the side on which the lateral lobe is more affected, or it may be more pronounced on one or the other side as the effect of the tumor varies. The incoördination affects the arm more than the leg. The reeling gait would seem to suggest that it is greater in the lower extremities, yet on examination it is found that this is due in great measure to the irregular action of the trunk muscles. The author has often noted when the patient stands erect that an unnatural degree of alternate contraction of the erectores spinæ of the two sides occurs as he attempts to maintain or attain his proper balance. Patients who are so unsteady on their feet that they can hardly walk present a comparatively slight degree of incoördination in carrying out movements as they lie in bed. He has not been able to make out any constant difference between the ataxy which results from cerebellar disease and that met with in extracerebellar tumors. Some slight degree of incoördination generally persists for many months after the disease has been removed by operation, and may be one of the last signs to disappear. He has carefully investigated in a number of his cases the sign described by Babinski as pathognomic of cerebellar disease, to which he has given the name of diadococinesia. It consists in the inability of the patient accurately to perform rapid alternate movements with the homolateral limb, though the individual movements are easily possible. It is tested by requesting the patient to pronate and supinate the forearm in rapid succession; this can be quite naturally executed by the contralateral limb, but the homolateral arm is moved slowly, awkwardly and irregularly. This phenomenon seems forcibly to confirm the author's analysis of cerebellar ataxy—that it is a dysmetria or defective control of muscular action, with inaccurate combination of the component muscular contractions. It seems to him that this inability rapidly to repeat movements is dependent upon the defective coöperation of the muscles and their antagonists, due in part, at least, to the diminution of the reflex muscle tone described, and to the consequent failure of the antagonists to control the primary movement, owing to their lack of tone.

Attitude.—In many cases of unilateral cerebellar and extracerebellar tumors the head is held in more or less characteristic attitude. When the

patient sits or stands it is slightly flexed to the side of the lesion and rotated so that the chin is directed toward the opposite shoulder, and the occiput approximated to the point of the homolateral shoulder. Though very characteristic, this attitude is neither constant nor pathognomic. Occasionally in cerebellar growths the head is held in the reverse position, and this "cerebellar attitude" of the head is met with in cases of pontine, and, more rarely, of fore-brain neoplasms. It cannot, therefore, of itself be used as a positive sign of cerebellar disease or as a definite aid in its localization.

Gait.—The gait of cerebellar disease has been accurately described as drunken, staggering or reeling, but further analysis of its characteristics is necessary before it can be used as an aid in localization of the lesion. There appear to be two distinct components which characterize the gait peculiar to unilateral cerebellar disease: (1) A tendency to stagger and stumble to the side of the lesion; (2) a tendency to deviate from the desired course toward the side of the lesion. The stumbling is more or less characteristic; the patient when walking suddenly totters as though to save himself from falling, as if he were drawn by an unseen influence toward the side of the disease, but as a rule, he quickly recovers his balance and direction. He may occasionally stumble to the opposite side, but he does so less frequently and to a less extent. This stumbling is rarely of such a kind as to suggest that it is due to weakness or giving way of the homolateral leg.

Sensory Symptoms.—Alteration of cutaneous sensibility never occurs in cases of cerebellar disease except when the tumor involves the pons, either directly or indirectly, by pressure, or causes secondary softening.

Mental Condition.—Cerebellar growths do not seem to have any effect on the psychical functions *per se*, though any acute increase of intracranial pressure may cause a drowsy or stuporous state, as a rule of brief duration.

Tendon Reflexes.—The variability of these reflexes is one of the most striking signs of cerebellar lesions. In some cases they are increased, while in others they are diminished or lost, but any one case may present both extremes within short periods.

The author further considers the differential diagnosis in a complete and detailed manner, which precludes abstraction, as does also a discussion of the relation of the symptomatology of cerebellar disease in man to the experiments in animals. A full clinical summary is appended.

JELLIFFE.

Journal de Psychologie Normale et Pathologie

(Vol. 2, 1905, Jan.-Feb.)

1. Repeated Attacks of Motor Aphasia in a Morphinomaniac. ROY and JUQUELIER.
2. A Comparative Study of the Psychology of Certain Motor Manifestations Commonly Referred to as "Tics." DROMARD.
3. A Note Upon the Conscious Appreciation of Words in the Use of Language. LALANDE.

1. *Repeated Attacks of Motor Aphasia in a Morphinomaniac.*—The case reported is that of a woman, sixty-one years of age, who was addicted to the use of morphine (about 1 gramme a day) for twenty-eight years. She presented at no time the slightest evidence of any sort of organic lesion, unless a slight degree of cardio-vascular excitability were to be considered as such. Gradual withdrawal of the drug was successfully accomplished with the aid of psychotherapy. Five different times she had had attacks of motor aphasia, the last attack having been observed and closely studied by the writers. Typical in every respect, this motor aphasia

involved both the patient's speech and writing. The account of the previous four attacks, given to the writers, showed that they were exactly similar to the fifth attack in both their symptomatology and transitoriness. In the further discussion of the case it is pointed out that this was not hysterical aphasia, though the patient did manifest at times distinct signs of hysteria, such as frequent outbursts of anger, transient paresis of the left arm, attacks of stammering, and decidedly functional dysbasia. In hysterical aphasia, writing is practically always unaffected. The writers declare that they have sought in vain for a description, or even a mention, of morphinomaniacal aphasia in the literature.

2. *Comparative Study of Psychology of "Tics."*—This is a lengthy analysis and discussion, with illustrative cases, of the psychic nature and origin of such phenomena as tic, stereotypy, catatonia and various automatic movements of idiocy and dementia.

Tic and stereotyped movements are usually started in the beginning with some purposive object in view; but later they become a mere fixed habit, without reason or purpose. They thus result from a secondary automatism; the automatism of tic, however, is dependent upon a totally different mechanism from that of stereotypy. The special characteristics of tic are its premature or unexpected appearance, its persistently convulsive nature, its subjection to the modifying influence of the will, and its being overshadowed by an emotional element in relation to the consciousness. A tic is more like an obsession; it is preceded by a feeling of genuine distress, and it is followed by a feeling of relief; it is thus within the sphere of the emotions. Stereotypy, on the other hand, is a manifestation of a distinct, isolated mental act; it is the ego itself in action. The victim of tic is, as it were, a spectator of his own exhibition; the victim of stereotypy is not a spectator of his own doings, but is identified in and within them. Tic is parasitical in its relation to the consciousness, and the latter remains undisturbed by it; stereotypy involves the entire activity of the consciousness, and the latter is, therefore, constrained and reduced by it to a singleness of action.

The automatic movements of idiocy are unlike those of stereotypy in their commencement, in the fact that they are never due to full consciousness and volition. They are the expression of a mere primitive automatism, and not of a secondary automatism, as the tics and stereotyped movements are.

The stereotyped movements of the precocious demented are not the same as the automatic actions of the idiots, or as the movements of typical stereotypy, for they are not entirely outside of the realm of consciousness and volition as in idiocy, emanating here rather from a diseased and vicious state of volition and consciousness; they are not obsession-like, as they are in ordinary tic; and they are not entirely of an indifferent character, as they are in typical stereotypy.

The author traces all of these movements to an atavistic tendency, and to our evolution from the simple, primordial cell wherein is preëminently observed a repetition and monotony of all actions, and an absence of the perfect systematization that characterizes the higher psychic acts of the normal human being.

3. *A Conscious Appreciation of Words.*—This is a comment upon an article by M. O. F. Cook in the *Monist* for July, 1904. Using by way of illustration a curious letter written by an old domestic, the author concludes, after a brief discussion of the question, that language is not formed of mere words in the consciousness of those who employ it, any more than a melody is formed by the mere notes being thought of first separately, or a line is formed by thinking of the points that constitute it.

METTLER (Chicago).

Monatsschrift für Psychiatrie und Neurologie

(1905, January.)

1. The Commissure of Gudden, Meynert and Ganzer, and the Results: Upon the Optic Tract of Atrophy. of the Bulb. M. PROBST.
2. Epileptic Disturbances of Consciousness of Unusual Duration and Forensic Consequence. MÖRCHEN.
3. Sensory Mono-Neuritis. R. KUTNER.
4. Ideation. E. STORCH.
5. Allopsychic Mania. A. KNAPP.
6. Pseudo-Melancholia. O. JULIUSBURGER.
7. The Tenth Meeting of the Middle German Psychiatrists and Neurologists in Halle a. S., on the 23rd of October, 1904. LACHMUND.
8. The Thirty-fifty Assembly of the Southwest German Alienists in Freiburg i. B., on the 29th and 30th of October, 1904. L. MANN.

1. *Commissure of Gudden, Meynert and Ganzer.*—Probst reports the microscopical examination of the brain of a woman seventy-six years of age, demented and totally blind. This blindness had evidently been acquired some years previously, and involved destruction or atrophy of the eyeballs. The patient also had a carcinoma and various other lesions. An uninterrupted series of sections was made through the chiasma and the optic tract and stained by the Weigert-Pal method. Probst gives a careful description of the microscopical changes that cannot well be abstracted. The important conclusions are that Meynert's commissure is composed of fibers arising chiefly in the middle brain. They appear to be independent of Ganzer's commissure, of the fillet, and of Luys' body. Probst concludes that the commissures of Gudden and Ganzer have no actual existence, but that the bundles of fibers supposed to represent them belong really to well-known tracts.

2. *Epileptic Consciousness.*—A man with hereditary epilepsy at first showed only the symptom of intolerance for alcohol. At the age of twenty-two he had an attack of disturbance of consciousness, in which he wandered away from the house, and only returned to his normal state two days later. Three months later he had a second attack, lasting five or six days. During a third attack he remained absent ten days. The attacks always commenced with discomfort, headache, flashes of light and tinnitus. In a fifth attack he recovered consciousness after an interval of two months in prison, and learned that he had stolen a bicycle, a watch and some money, and had committed several other trifling offences. During this interval he was observed by numerous acquaintances, all of whom he recognized, and apparently remembered events that had occurred previously. In a later period he committed a number of small crimes, and again recovered his own consciousness and continued his industrious and strictly honest life. Mörchen collects a number of cases of a similar condition from the literature. This patient was repeatedly declared irresponsible for his acts during the periods of perverted consciousness.

3. *Sensory Mono-Neuritis.*—Kutner reports a case of neuritis involving all the branches of the left trigeminus. The different sensations were unequally involved; the temperature and pain senses were greatly reduced, while touch was almost normal. The case was further complicated by a congenital anosmia. He also reports a case in which the dorsum of both feet was involved, and another in which the inner sides of the legs were involved. In the first case the superficial perineal nerve was affected, and in the second the saphenus major.

4. *Ideation.*—Storch's article is a psychological review of a previous article by Liepmann. He believes that so-called consecutive thinking is solely characterized—psychically—by the fact that each step is merely the voluntary result of the preceding state of consciousness. Assuming that

the organ of consciousness is a flat surface, some of the memory elements may be situated in it. Others below it, in another flat surface, which also contains the subcortical ganglia. The two surfaces are connected. If a part of the lower surface becomes irritated, it may communicate irritation to the upper surface and consciousness will ensue. As long as the irritation persists the perception is unchanged. When it ceases, however, alterations take place in perception and that ensues. In the succession of ideas from internal causes the perceptive centers are influenced to continue after the irritation ceases. These internal causes are not powerful, and consequently, new irritations from the periphery start a new succession of changes.

J. S.

5. *Allopsychic Mania*.—A man of forty-nine had attacks of mania during which he was well oriented regarding time and place, but mis-called individuals. In the first attack the condition was diagnosed paranoia in spite of certain rather characteristic signs of mania. In a second attack a more typical form of mania appeared. Knapp believes that these paranoic elements in maniacal attacks are susceptible of explanation. Every maniac is certain, sooner or later, to come in conflict with his environment, and this is partly due to a false conception of the external world; and there are many forms of all psychic disturbance of orientation in the picture of pure mania. In the present case, in both attacks failure to recognize persons was a prominent symptom. It may be that in some cases this is exaggerated by the patient as a sort of joke. In others, there is no doubt that there is complete disturbance of the factor of recognition, and this is probably the result of the delusions of grandeur. These allopsychic manifestations apparently are more prominent in cases that have indulged to excess in alcohol for long periods. It appears, however, that in the alcoholic mania of the French writers allopsychic manifestations do not play an important rôle.

6. *Pseudo-Melancholia*.—A woman of thirty complained of defective intellectual processes. She was unable to reach a decision, had no will power, felt unhappy, reproached herself, and had ideas of suicide. When tested it was found that her brain was perfectly normal; she was capable of memorizing, repeating and giving the substance of various poems, and performing other tasks. Juliusburger, after discussing the psychology of this condition, prefers to name it pseudo-melancholia.

7. *German Psychiatrists*.—The following papers were read at the session of the mid-German psychiatrists and neurologists in Halle, a. s., on the 23rd of October, 1904:

1. Brain Fibers, with the Exception of the Pons and Medulla, with Demonstration by a Projection Apparatus. By Förster.

2. Retroactive Associations. By Ziehen.

3. Isolated Constrictions of the Lower Horn of the Lateral Ventricle, and Its Clinical Results, with Autopsy. By Cramer.

4. The Pathogenesis of Acquired Internal Hydrocephalus. By Weber.

5. Three Cases with Associated Motor Manifestations. By Binswanger.

6. Defects in Attention. By Boldt.

7. A Demonstration of Brain Sections. By Liepmann.

8. The Oxygen Treatment in Cases of Mental and Nervous Disease. By Alt.

9. The Significance of the Ion Theory for the Treatment of Epilepsy. By Hoppe.

10. The Treatment of Neuroses by the Cathartic Method. By Stegmann.

J. S.

8. *German Alienists*.—At the Thirty-fifth Assembly of the Southwest German Alienists in Freiburg I. B., on the 29th and 30th of October, 1904, the following papers were read:

1. Critical Summary Upon Slightly Abnormal Children. By Weygandt.

2. A Report Upon the Commission for Sanatoria for Nervous Diseases. By Neumann.
3. Endogenous Symptom-Complex in Exogenous Forms of Disease. By Fauser.
4. Dementia and Aphasia. By Rosenfeld.
5. Demonstration of Preparations from Encephalitis. B. Spielmeyer.
6. Installation for Permanent Baths. By Hoche.
7. Cysticercus of the Brain. By Wollenberg.
8. The Biology of Degeneration of the Nerves. By Merzhacher.
9. Tramping: Its Prevention and Control. By Wilmanns.
10. A Case of Imperative Hallucinations. By Hoche.
11. Disturbances of Sleep. By Pfister.
12. The Significance of Early Marriage for the Development of Nervous Disease in Women. By E. Beyer.

(1905, February.)

1. Studies Upon Defective Observation. K. BOLDT.
2. Clinical Psychologic Methods of Investigation. K. HEILBRONNER.
3. Pseudo-Melancholic States. W. VORKASTNER.
4. The Delusion of Bodily Influence. PFERSDORFF.
5. A Case of Hypertrophic Tuberos Sclerosis. G. PERUSINI.

1. *Defective Observation*.—Boldt records the results of the tests upon the faculty of attention made upon thirty-five patients, chiefly according to the method of Ranschburg. He noted first that in normal persons very rapid improvement occurred in the course of the experiments, and that there was also an improvement corresponding to the duration of time after the observation, so that the best results were obtained in the course of twenty-four hours. In cases with disease of the faculty of attention the patients invariably grew worse after the expiration of some time. In cerebral syphilis it was found that the faculty of attention varied considerably in the course of the disease. The most serious defects occurred in Korsakow's psychosis, and in the toxic forms of psychosis. The method sometimes served to distinguish between organic and functional diseases, as for example, between epilepsy and hysteria, the intelligence remaining normal in the latter condition. It appears that the ability to associate names with persons, and particularly to recall numbers, is the first that is lost. The results are given in tabular form.

2. *Psychological Methods*.—Heilbronner has devised a series of pictures for testing the power of recognition and naming in various forms of psychosis. These pictures consist first of very simple outlines, which in successive reproductions are made more and more significant by the addition of other details. He found that in different cases the power of recognition differed greatly. Sometimes patients were able to recognize the nature of the object from the outlines; in others they were never capable of recognizing more than minor details. The inability to recognize the simpler forms may be regarded as a reduction of the power of attention. This appears to be more reduced in the cases of stupor. In dementia the results were very poor. The series may be used for testing the course of ideas which are often developed in the answers, for the power of attention, and occasionally the time of reaction, may be noted.

3. *Pseudo-Melancholia*.—Vorkastner reports a series of cases characterized by symptoms that he regards as simulating, but not true, paranoia. A woman of forty-seven, after the death of her child, developed hallucinations and a state of depression in which she reproached herself. In the course of the condition the depression disappeared, but the hallucinations persisted. The second case, a man of thirty-two, after an attack of influenza, developed hallucinations of sight and hearing, and had con-

vulsive attacks. Later he became anxious, self-reproachful, and still later the depression disappeared, but the hallucinations persisted and the case developed into one of chronic hallucinatory paranoia. The third case, a woman of thirty-three, also had hallucinations with depression, and heard voices that reproached her. The fourth case, a man of forty-five, had had an attack described as melancholia. He believed that various persons, particularly his wife, were attempting to injure him. He also accused himself of various criminal actions. He reports four other cases, all representing hallucinatory paranoia, succeeded by a stage of melancholia during which there was anxiety, depression and ideas of sinning. Finally he discusses the nature of these cases. He believes not only that there is a pseudo-melancholic condition, but also a pseudo-maniacal state.

4. *Bodily Influence*.—Pfersdorff reports three cases characterized by symptoms of irritation as a result of acoustic, optic and tactile impressions. These impressions were usually in the form of various noises, quickly changing light impressions, as if a person were blinded with a mirror, and various forms of paresthesia. These cases also showed temporary disturbance of speech in the form of diminution of the number of words available. The most remarkable clinical feature in all the cases was the periodic recurrence of the symptoms. After each attack there was some defect in the intelligence, but not sufficient to cause them to be considered as cases of dementia præcox. He reports an additional case of this character with an alcoholic etiology.

5. *Tuberous Sclerosis*.—A boy of twelve, an idiot, had repeated attacks of epilepsy in which he finally died. At the autopsy numerous hard, dirty-white masses were found in the brain, irregularly symmetrically distributed, and involving a large portion of the convolutions. Microscopically it was found that in the cortex of the affected parts the cells were diminished; they were altered in structure; the neuroglia cells were increased in size, and the neuroglia fibers increased in number. Hyalin thrombosis of the capillaries was also observed. Slight changes were found in the white substance, and in the spinal cord merely a rarefaction of the white substance could be observed. Pfersdorff adds 6 cases to the collection of Pellizzi, making the total number on record 32.

(1905, March.)

1. A Particular Localization Course of Multiple Sclerosis. R. CASSIRER.
2. The Sensory and Motor Rolê of the Optic Thalamus. W. v. BECHTEREW.
3. Progressive Paralysis and Chorea. J. DRÄSEKE.
4. A Case of Hypertrophic Tuberous Sclerosis. G. PERUSINI.
5. Studies in a Case of Eclamptic Psychosis. K. HEILBRONNER.

1. *Multiple Sclerosis*.—Cassirer describes some cases resembling those to which attention has been called by Oppenheim, characterized by ataxia and crossed hemiparesis and bulbar symptoms. Oppenheim believed it represented the first stage of multiple sclerosis. The onset was acute and recovery, or partial recovery, prompt, but in three cases multiple sclerosis developed later. It is impossible to give details, even briefly, of all the cases that Cassirer reports. They are usually patients in early adult life. The symptoms are those of disease of the cervical portion of the cord with special involvement of one of the hands, and often with ataxia and weakness in the legs. Sometimes the ataxia commenced acutely with vomiting and vertigo, sometimes more slowly. Occasionally there was tenderness over the cervical vertebræ. Cassirer discusses spinal ataxia, particularly the form affecting a single upper extremity. The intention tremor resembles in some respects ataxic movements. Assuming that this is a type of multiple sclerosis, Cassirer reports 6 cases in a total service of 150 cases of multiple sclerosis. Regarding the nature of the

lesion, Cassirer believes that there is disturbance of the white substance in the posterior portion of the cord surrounding the posterior artery and its branches. The nature of the lesion is, of course, difficult to determine. Localization can usually easily be made.

2. *Rôle of the Optic Thalamus*.—Von Bechterew reaches the following conclusions regarding the functions of the optic thalami: If all parts of the brain excepting the thalami are removed, the animals lose psychical voluntary movements, but they maintain all the movements of expression; thus, their voice resembles that of normal animals. If the hemispheres and the optic thalami are removed, only local motor manifestations persist; the animals merely manifest restlessness upon local pain, and if their voice persists it is a monotone. If the thalami are electrically stimulated, a variety of emotional manifestations occur: growling, barking and howling. These are more prompt if both sides are stimulated. If the posterior portions of the thalami are destroyed, the capacity of expressing emotions is disturbed. If only one thalamus is injured, this disturbance of emotional expression occurs only on the opposite side. Voluntary motion persists. There is no doubt of the existence of centripetal fibers uniting the cortex with the thalamus, nor can it be reasonably doubted that centrifugal tracts also occur. There is no definite evidence, however, at present regarding the descending centrifugal tracts arising from the thalami, although von Bechterew believes that they must certainly be assumed to exist. He discusses the union of the thalamus with various nuclei and structures in the neighborhood, and expresses the opinion that the rôle of a motor ganglion is chiefly fulfilled by the median nucleus.

3. *Progressive Paralysis and Chorea*.—Dräseke, after collecting several cases from the literature, reports 4 cases of progressive paralysis and chorea. The first case, a man of 31, after luetic infection and injury to the head, had delusions of grandeur, was extravagant, had hallucinations and choreic movements of the extremities. He gradually grew worse, had an attack of collapse, after which the choreic movements disappeared and were replaced by sluggish muscular contractions all over the body. Macroscopically, the appearance of the brain was that of general paresis. Second case, a man of forty-nine, had had luetic infection, and nineteen years later paralysis of the eye-muscles. Five years later he became very restless, had choreic movements of the arms, and finally developed general paresis. An autopsy was not obtained. The third case, a man of twenty-seven with neuropathic heredity and syphilic infection, had been depressed for a year. He then became excited, had delusions of persecution, and there were violent choreic movements in the whole body. He also had hallucinations, the condition lasting four weeks. It was then found that his intelligence was very defective. At the time this paper was written the patient was confined to bed. The fourth case, a woman of forty-four with neuropathic heredity, at the age of twenty-seven had had a violent emotional shock, followed by a period of prolonged trembling. Later there was an apoplectic attack, from which she apparently made a complete recovery. Then she was depressed, confused, had violent choreic movements of the head, body and extremities that also involved the tongue, had delusions of grandeur, and then a remission followed by a similar attack. The symptoms were those of parietic dementia. Dräseke concludes that the occurrence of choreic movements in the third decade of life, or later, suggests the occurrence of parietic dementia.

4. *Tuberous Sclerosis*.—Perusini continues his discussion of tuberous sclerosis of the brain. (The paper is still unfinished.)

5. *Eclamptic Psychosis*.—Heilbronner reports the case of a girl, eighteen years of age, in her first pregnancy, who developed uremia, following which she apparently entered into a prolonged state of confusion. (The present paper gives the data of the examination. It is still unfinished.)

J. SAILER (Philadelphia).

Revue de Psychiatrie et de Psychologie Expérimentale

(1905, June.)

I. Heredity and Education in the Genesis of Mental Diseases. TOULOUSE and DAMAYE.

1. *Heredity and Education*.—The author takes the broad general position that altogether too much is laid at the door of heredity, and that when the relative effects of heredity and environment are carefully studied the latter will be shown to have a much more prominent part in producing mental and physical disease than is ordinarily supposed. It must be remembered that the child of defective parents is brought up in the atmosphere they have created; in a régime which, both from the physical and moral point of view, is abnormal, and that the children naturally absorb the ideas and adapt themselves to the vicious habits they find in their environment. This same thing is even seen in the realm of physical disease. The children of tubercular parents, if removed from their unhealthy surroundings, do not show a sensibly greater susceptibility to this disease than others.

The method of interpreting the influence of heredity has been very defective. Because a condition existed in both parents and child, it was sufficient to stamp it as hereditary. Education by environment, imitation and example is, however, well shown in the cases of suicide by several members of the same family at about the same age and in the same way, by the cases of alcoholism in which the same liquor is drunk by the descendant and in which it can after be shown that the taste was acquired directly from the parent at an early age. This is also shown by the fact that the disorders having apparently the most marked heredity have no anatomical basis; thus paresis, and even epilepsy, are not markedly hereditary, while emotional troubles, obsessions, impulses, and the like, are frequently, and Briquet even says that most hysterical mothers give birth to hysterical daughters.

Early education is an important factor for good or evil, as the case may be, and may do much to shape an insane character. The peculiarities of character we see about us may by only changes in degree become psychoses, sadness become melancholia, jealousy a monomania, and the result is shaped largely by education and environment. Not alone the family surroundings exercise an important influence, but the associations at school and college. The direct influence of environment is shown by the epidemics of suicide; suicide by the same means, the similarity of insane ideas among similar classes of people and during the same period of time, *i. e.*, the ideas current in the Middle Ages were of a religious caste, etc.

Toulouse speaks of hysteria and neurasthenia as artificial diseases fabricated by the more or less conscious reason of the subject. They depend largely on education, and are often made worse by the attitude of their associates toward them.

The proof of all this is shown by the fact that isolation cures many of these cases, as has been brought out in the works of Bernheim and of Dubois. The ill-directed ideas and emotional reactions are successfully combated by reason and reëducation.

(1905, July.)

1. Special Asylums for Criminal Insane and Dangerous. LÉRIEUX.

2. The Memory of Dreams in Children. DUPRAT.

1. *Special Asylums*.—The author advocates the establishment not only of hospitals for the insane criminals, *i. e.*, those becoming insane while serving sentence, but special hospitals for the dangerous lunatics, to which should be transferred those who have committed dangerous acts while insane, the dangerous who have already been committed to other hospitals, the insane criminals whose sentences have expired, the morally insane, criminal born, degenerates with dangerous tendencies, and in general, the vicious of all classes.

2.. *Memory of Dreams in Children*.—Two children were observed, but the author reaches practically no conclusions.

(1905, August.)

1. The Etiology of General Paresis from the Discussions of the Academy of Medicine and the New Researches on Experimental Syphilis.—VURPAS.

1. *The Etiology of General Paresis*.—This article contains nothing new, being merely a review of the present status of the relation of syphilis to paresis. The author is hopeful of results from the inoculation of the anthropoid apes, and is optimistic as to the probable discovery of the etiological factor in the *spirochate pallida*...In summing up, he says the one point upon which all authors, with the exception of Lancereaux, agree is the frequency of syphilis in the antecedents of paretics. Divergence begins only when they begin to interpret this fact, and, perhaps, at bottom the author's are less in disaccord than they seem to be. In the last analysis this question is reducible to a greater or less extension in the comprehension of the notion of causality. One can thus, according to the elasticity or the sign with which he employs this term, speak of syphilis as the cause of paresis, or paresis of syphilitic origin, or yet that syphilis is a good soil for paresis to develop on.

WHITE.

Rivista di Patologia nervosa e mentale

(1905, January.)

1. Sporadic Cretinism. E. LUGARO.

1. *Sporadic Cretinism*.—This is a lengthy article, profusely illustrated with pictures of patients before and after treatment, tables of weights, and X-ray photographs. The author concludes that sporadic and endemic cretinism are identical, and that this identity is especially indicated by their like reaction to thyroid treatment. This treatment is applicable to all cretins, young and old, improving the nervous condition, the capacity for work, improving the general nutrition and improving the resistance. Whether its use is prophylactic or not, it should be general, so as to bring the cretins to the maximum efficiency, increasing their working powers, and limiting the number that become public burdens.

WHITE.

Archives de Neurologie

(1905, No. 116, August.)

1. A Case of Disease of the Cauda Equina Produced by Tuberculosis of the Sacrum. ITALO ROSSI.

2. Cholemia and Melancholia. P. COLOLIAN.

3. Fixation of the Number of Physicians in Insane Asylums. BOURNEVILLE.

1. *Cauda Equina Lesion*.—Rossi gives the clinical history and post-mortem findings of a case of superficial tuberculous osteitis of the sacrum with invasion of the epidural tissue and reactionary thickening of the dura, which compressed the lower lumbar and sacral nerves. In the literature the author found only one case with autopsy, and only five cases with clinical descriptions, but he believes that careful neurological examinations would demonstrate the disease more frequently. The patient, a man of thirty-nine years, who had two hemorrhages some twenty years before, was a confirmed alcoholic and dyspeptic. During the last six months of life the patient became greatly emaciated and suffered violent pains, which resembled a double sciatica. Trophic and motor disturbances were slight.

The autopsy showed compression, principally of the posterior roots, with some ascending degeneration in the cord. The peripheral nerves were intact, and an alcoholic sensory polyneuritis was thereby excluded.

2. *Hepatic Function and Depression*.—Cololian first considers the relationship between liver disease and melancholia, and holds that the latter, instead of being a pure psychosis, is a disease of the entire organism and presents physical symptoms and signs which are referable principally to affections of the liver. He then traces the parallelism between the two conditions, and notes that in each are found xanthoderma; dyspepsia, boulimia, constipation; insomnia, migraine; sexual weakness, bradycardia, urobilinuria, etc. The third section deals with hepatopathic and neuropathic heredity among melancholiacs. The family histories show jaundice, cirrhosis and gall stones. The personal histories include jaundice of the new-born, catarrhal and lithiasal jaundice. Both histories also show clear evidence of mental degeneracy. The author believes that the degeneracy affects the liver as well as the brain, and that, with this predisposition, melancholia easily arises from the stress of an exciting cause like infectious fevers, puberty, pregnancy, etc.

3. *Hospital Management*.—Bourneville reports the following action of the Council Superior on his recommendations. The average number of patients under one physician should not exceed 400, if the annual admissions do not exceed 200. For every 100 admissions one interne should be allowed. The chief physician should have charge of the admissions and curable cases; the assistant physicians, the chronic diseases. Internes should be enlisted by concours, and should be paid at least \$200 a year, with an increase of \$25 yearly. The salary of assistant physicians should be increased \$125 a year. Complete hospital reports should be published each year.

H. J. NICHOLS (Washington).

Centralblatt für Nervenheilkunde und Psychiatrie

(Vol. 28, 1905, No. 187, April 15.)

1. An Hypothesis Concerning the Nature of the Katatonic Symptom-Complex. LUNDBORG.

2. Unilateral Hippias in Progressive Paresis. GAUPP.

1. *Katatonic Symptom-Complex*.—Lundborg discusses the relation between the so-called motor-neuroses and a condition of insufficiency of the parathyroid glands. The theory is illustrated diagrammatically by a chain in which, on one side, is indicated the association of thyroid insufficiency with myxedema and a condition of stupor; of thyroid hyperfunction with Basedow's disease and psychic conditions. On the other side of the chain, insufficiency of the parathyroids as related to the katatonic symptom-complexes—paralysis agitans, tetany, myoclonus-epilepsy and myotonia; hyperfunction of the parathyroids—with myasthenic paralysis and family periodic paralysis. This theory was discussed in a previous paper. The results of experiments by Blum are quoted at length, relating the production of psychic disturbances in dogs after removal of the thyroid. Also an experiment by Berger in which a dog was injected with serum from a katatonic patient, producing tremor, clonic muscle contractions, and finally stupor with katatonia. Lundborg believes that there exists a distinct endogenous toxin which caused the symptoms described; also, that the myoclonic contractions and the katatonic symptoms are related to the toxin.

Based upon this, he believes the katatonic symptom-complex of tetany and myoclonus to depend upon a distinct insufficiency of the parathyroid glands. Also, that the psychic symptoms present in dementia præcox depend, perhaps, upon an altered chemistry of the thyroid gland ("Insuffizienz und Dysfunktion"). The above-mentioned diagram is, therefore, enlarged, including within the varieties of katatonia, myxedema,

Basedow's disease, paralysis agitans and paralytic myasthenia.

2. *Unilateral Hippus*.—Gaupp notes the lack of unanimity concerning the meaning of the term "hippus." He uses the term to indicate a slow, rhythmical contraction and dilatation of the pupil, occurring without the stimulus of any of the known causes of pupillary movements. (Light, darkness, convergence, accommodation, pain.) After citing instances in which hippus has been observed by others, Gaupp relates a case in which, following a blow on the head, there developed typical symptoms of advanced progressive paralysis. The left pupil was insensible to all forms of stimuli, but showed a rhythmical variation in its diameter, 1-7 contractions occurring in 15 seconds.

(Vol. 28, 1905, No. 188, May 1.)

1. On the Importance of Attention to the Localization and Development of Hallucinatory Pictures. V. BECHTEREW.

2. Contribution to the Symptomatology of Chronic Progressive Chorea.

1. *Hallucinatory Pictures*.—The calling up and localization of hallucinatory pictures by attracting the patient's attention to an actual stimulation like that which comprises the hallucination, according to Bechterew, is made possible by experiment; also was he able to change the location of hallucinatory sounds in alcoholics with hallucinations. This was accomplished by attracting the patient's attention to the sound produced by the vibration of an induction apparatus, when the same sounds which he has heard elsewhere seemed to him to come from the induction apparatus.. Wherever the attention of the patient be drawn, there will he hear the hallucinatory sound. The same state of affairs prevails when, in an hysteric, auditory hallucinations are suggested during hypnotic sleep. Similar phenomena occur in visual hallucinations. When a single variety of hallucination existed, *c. g.*, auditory, it was, as a rule, impossible to suggest hallucinations in other organs. The involuntary attraction of the attention, therefore, can be made a means of the production of hallucinations.

2. *Chronic Progressive Chorea*.—Liebers reports a case, with typical symptoms of Huntington's chorea, giving an entirely negative history concerning any form of neurotic tendency in her antecedents, but in whose daughter appear feeble-mindedness and muscular twitching in fingers and face. The case described presented marked speech disturbance and dementia with occasional passionate outbursts. Dermographia and a diffuse erythema appeared during the periods of excitement, together with a slight right-sided paresis.

(Vol. 28, 1905, No. 189, May 17.)

1. *Tabes and Synergy*. CATOLA and LEWANDOWSKY.

2. On a Specific Antitoxine in the Blood Serum of Epileptics. CENI.

1. *Tabes and Synergy*.—Based upon the observation of cases with marked ataxia, the writers found that patients in which the ataxia was present in the upper extremities retained the muscle synergy in the flexors and extensors; that is, in clenching the fists and opening the closed fist. The writers' observations disagree with those of Foerster that muscle synergy depends upon the integrity of sensibility.

2. *Blood Serum of Epileptics*.—In a previous contribution Ceni demonstrated that the epileptogenous serum possessed a definite specificity for man, but not for other species of animals; also, that it varied with the intensity of the disease; *c. g.*, the status epilepticus. In the present investigation, the results of which he publishes in this paper, experiments were made with the "natural antitoxic substances of the sera of epileptics." He shows that the antitoxic substances of the blood of epileptics have the property of neutralizing the toxic action of the epileptogenous sera of man. Three series of experiments were made:

1. With serum of epileptics ~~during~~ the various phases of the regular course of the disease; *i. e.*, before, after and during the attack, and during the interval. Serum from a patient having attacks every 20-25 days was mixed with antiserum (0.5 ccm. in 10 ccm. of the former) and injected into another epileptic. The effect was the same in every case, namely, that the ccm. of serum neutralized the toxic effect of the 0.5 ccm. of the antiserum, in greater part or entirely.

2. With serum of severe cases (status epilepticus). This serum was *hypotoxic*; injected alone, it never produced signs of acute poisoning; on the contrary, almost without toxic effect. When 10 ccm. of the serum from this patient, with $\frac{1}{2}$ ccm., also $\frac{1}{4}$ ccm. antiserum, injected into another epileptic, produced at once the symptoms of an acute specific poisoning.

3. Experiments with the serum of epileptics, which following the injection of specific antiserum, also following the injection of hypertoxic serum of other epileptics, showed an aggravation of the disease, and at the same time a diminution of the antitoxic power of the blood-serum of these patients against the specific antiserum.

A. C. BUCKLEY (Philadelphia).

Miscellany

THE NON-TOXIC AMBLYOPIAS. T. W. Moore, Huntington, W. Va. (Journal A. M. A., Aug. 26).

The author classes the non-toxic amblyopias under three heads: 1. Those cases of amblyopia exanopsia held to be due to inability to use corresponding areas of the retina at the same time. This may be due to high refractive errors, to improper muscle balance or to non-development of the cerebral fusion center. 2. The hysterical amblyopias. 3. The somewhat similar but different group characterized by impaired vision, contracted fields for white and normal color fields, the color vision being proportionate to the general visual acuity; these cases are usually designated as anesthesia of the retina. Lastly, there is a sub-group of these latter due to traumatism, often with pathologic changes of the fundus from old hemorrhage or choroidal rupture that has left the parts uninvolved in a healthy condition, though vision has not returned. These cases are closely allied to the preceding group, differing only in etiology and in the limited results of treatment. Amblyopia exanopsia is usually easy of diagnosis, the defective vision, apparently normal fundus, frequent squint of one eye and the high refractive error making it clear from the first. Moore finds the convex-glass cure of Frommüller the most satisfactory treatment, and reproduces the directions in full. In some of his cases he has had surprisingly good results, and some improvement in all in which he could command the coöperation of the patient. With the hysterical amblyopias the diagnosis is also, as a rule, not difficult. The concentric and constant narrowing of the visual field with reversal for colors is characteristic. Other conditions may show the contraction, but not with the color reversal. In addition, there are the other signs of hysteria, both ocular and otherwise, to aid in the diagnosis. The treatment consists in general measures to build up the patient's health, correction of the hysterical tendency and of any errors of refraction, etc. As regards the cases grouped by him in his third class, and which fall etiologically under two heads, those due to traumatism and those of unknown causation, Moore disagrees with Charcot and Leber as to these being hysterical, and holds that the trouble is really in the retina instead of in the brain. An illustrative case is reported. His treatment in these cases is electricity, and he finds the faradic and high-frequency currents equally as efficient as the galvanic, and the high-frequency current perhaps the most useful. He applies the electrode over the closed lids, usually using the unipolar,

though the bipolar is equally useful; in applying the latter his method is to let the patient hold the other electrode in his hand. With the reflex amblyopias from irritation of the fifth nerve he has had no experience.

OCULAR SYMPTOMS OF ACCESSORY SINUS AFFECTIONS (W. C. Posey, Philadelphia, Journal A. M. A., Sept. 9).

While the average member of the profession, the author remarks, is conversant with the general symptomatology of sinus disease, there are yet many of the less striking symptoms with which they are less familiar. Many of these are among the earliest ones, and are attributed to eye-strain and refraction advised. In some cases the use of atropin employed to put the ciliary muscle at rest dries up the secretion and actually effects a cure. This, however, does not always happen, and much damage and loss of time may follow the error. Among the less frequent symptoms he includes implication of the optic nerve and disturbances of vision. The condition, he states, is to be studied by the usual methods with the ophthalmoscope, test cards, perimeter, etc. Orbital disease is usually secondary to sinus disease, and one of the earliest signs is a change in the contour of the orbital ring. The particular sinus involved cannot always be made out, but the character of the orbital displacement is often significant. Optic nerve involvement, circulatory disorders of the orbit and conjunctiva, etc., may also be of diagnostic value, but the symptoms may be obscured by the anatomic variations of the sinuses, which are not infrequent. Sinusitis is only rarely a direct cause of lachrymal disease, though it may more frequently produce it indirectly by way of the nasal mucosa. Edema of the lids is one of the most significant signs of accessory sinus disease, and may often first call attention to its existence. It is non-inflammatory, is usually most marked on the upper lid, and in the morning, disappearing during the day. A persistent blepharitis may accompany the chronic conjunctivitis of sinus disease, and may disappear only with the removal of its cause. The close anatomic association of eye muscles and nerves accounts for the occurrence of ocular paresis or paralysis from sinus disease. Paresis, indeed, may occur in very mild cases, and Posey is of the opinion that if many of the cases of palsy of extraocular muscles attributed to rheumatism were analyzed an affection of a sinus would be found to be the underlying cause in many instances. Conjunctivitis may be the result of the general mucous congestion, and occasionally there may be an implication of the cornea, either indirectly from the exposure incident to the exophthalmus, etc., or by implication of the fifth nerve. Pupillary changes may accompany the optic neuritis when it exists. Posey considers that intraocular affections, uveitis, etc., must be very rare, though some authorities hold that they are frequent. Refraction disorders and asthenopia occur from the pressure on the orbit and inflammatory interference with the musculature, etc. Headache and neuralgia are pretty constant attendants of sinusitis, and while not always characteristic, are often decidedly so. The special features are given in detail. Other symptoms of a general character, fever, evidences of cerebral congestion and irritation, neurasthenia, gastric disturbances, and even marked mental symptoms may also be induced. Cerebral symptoms indicating involvement of the meninges, or sometimes even brain abscesses, may occur.

THE PATHOLOGIC EFFECTS OF ALCOHOL ON RABBITS (J. Friedenwald, Baltimore, Journal A. M. A., Sept. 9).

The author publishes the results of a study of the effects of alcohol on rabbits. The general summary of these results has been already given by Professor Welch in the two-volume work of the "Committee of Fifty" on "The Physiologic Aspects of the Liquor Problem," noticed in *The Journal A. M. A.*, Nov. 16, 1903, p. 1361, but is quoted here in detail.

One hundred and twenty rabbits were utilized, and the observations extended over a period of several years. The smallest weekly dose was 20 c.c., the largest 50 c.c. The animal that lived longest consumed over 10 liters of absolute alcohol; another consumed over 18 liters of whiskey. There was a marked difference in the susceptibility of different animals, some dying after a few doses, others surviving for years. Young and small rabbits and pregnant females seemed most susceptible. The animals usually gained somewhat in weight at first; this was followed by a stationary period, and then a rapid fall preceding death. During intoxication the temperature fell 1 to 1.5 degrees. The blood examinations showed a fall to half the normal in the percentage of hemoglobin, but no marked change in blood cells till just before death. The gastric free hydrochloric acid decreased under the influence of the alcohol, and in some cases albumin and casts were found in the urine; in some cases in which these were not found the autopsy revealed kidney lesions. Alcohol evidently has a marked tendency to produce abortion in rabbits. Out of a series of 38 pregnant rabbits 20 died of septicemia following abortion, and the organism of rabbit septicemia was found in all, though they had been thoroughly isolated from one another. Of the rest, nine had constant abortions, none coming to full term. Three had normal deliveries, but the young all died a few days after birth. Complete autopsies were made in all cases. The lesions found were fatty degeneration of the heart muscle, which was lacking in animals killed after cessation of the use of alcohol, showing that it was not a permanent condition; fatty lesions of the liver and kidneys were also observed in some cases, and occasionally liver cell necrosis, singly or in groups. The experiments failed to produce satisfactorily genuine hepatic cirrhosis, though the liver was found more or less cirrhotic in a few instances. Fatty degeneration of the kidney tubules, thickening of the vessels and atrophy of the glomeruli were noted in a number of cases; in others no changes were observed. Evidences of gastric ulcerative processes were seen in a few instances; congestion was more common. The intestines were usually normal. The testicles frequently showed a diffuse fine deposition of fatty granules in the epithelium of the tubes and interstitial cells. The most notable changes in the brain, as reported by Dr. Berkley, were atrophy of the cortical cells, which was apparently quite marked.

STUDIES OF FEEBLE-MINDEDNESS. Shepherd Ivory Franz (Journal of Philosophy, Psychology and Scientific Methods).

Under this title there have been included the following articles on idiots, imbeciles, *enfants arriérés*, *enfants faibles d'esprit* and on *enfants anormaux* and abnormal children when it was evident that the term "abnormal" was used synonymously, or nearly so, with "feeble-minded":

1. "Les enfants anormaux à Bruxelles. Demoor et Daniel. *Année psychologique*, 1900, VII., 296-313.

2. "Expériences de copie: essai d'application à l'examen des enfants arriérés." Simon. *Ibid.*, pp. 490-518.

3. "Interprétation des sensations tactiles chez les enfants arriérés." Simon. *Ibid.*, pp. 537-558.

4. "Eine experimentelle Studie über die Association in einem Falle von Idiotie." A. Wreschner. *Allg. Zeitsch. f. Psychiatric*, 1900, LVII., 241-339. (Complete account of association experiments. Prolix, but good in giving material for comparison.)

5. "Taste and Reaction Time of the Feeble-Minded." A. R. T. Wylie. *Journal of Psycho-Asthenics*, 1900, IV., 109-112.

6. "Study of the Senses of the Feeble-Minded." A. R. T. Wylie. *Ibid.*, pp. 137-150.

7. "Memory of the Feeble-Minded." A. R. T. Wylie. *Ibid.*, 1900, V., 16-24.

8. "Motor Ability and Control of the Feeble-Minded." A. R. T. Wylie. *Ibid.*, pp. 52-58.
9. "L'illusion de poids chez les anormaux et le 'Signe de Demoor.'" E. Claparède. *Arch. de Psychol.*, 1903, II., 22-32.
10. "La mesure de l'attention chez les enfants faibles d'esprit (phrenastheniques)." F. Consoni. *Ibid.*, pp. 209-252. (Good material, but not sufficient work on normal children for comparison. Esthesiometric results not checked by other methods.)
11. "Notes sur la psychologie des enfants arriérés." T. Jonckheere. *Ibid.*, pp. 253-268.
12. "Psychophysical Tests of Normal and Abnormal Children." R. L. Kelly. *Psychol. Review*, 1903, X., 345-372. (Incomplete and evidently hasty work. Not sufficient account of methods for purposes of confirmation. Subjects not described.)
13. "Experimental Studies in Mental Deficiency: Three Cases of Imbecility (Mongolian) and Six Cases of Feeble-mindedness." F. Kuhlmann. *Amer. Jour. of Psychol.*, 1904, XV., 391-446. (Excellent article. Material well digested. Good bibliography.)
14. 15. "Ueber die Assoziationen von Imbezillen und Idioten." K. Wherlin. *Jour. f. Psychol. u. Neurol.*, 1904, IV., 120-123, 129-143. (Confirmation and extension of Wreschner's work. Many cases.)

The study of the mentally defective classes is of interest and importance to both physicians and psychologists. Unfortunately, however, psychologists have concerned themselves almost wholly with the investigation of the mental processes of normal people, and have not considered the subject of abnormal psychology. Physicians, on the other hand, are interested in abnormal psychology, but largely and almost exclusively in those mental processes which are of importance for diagnosis, and those which help in making prognoses. What information we have, therefore, is meager in amount and, perhaps, as is sometimes said, superficial. Many interesting mental phenomena are noted and explained in an off-hand way, and many have not been noted, because they are thought to be of little diagnostic or prognostic importance. The conditions which have been studied only superficially and those which have not been studied are likely to throw light upon similar, but elusive, processes in normal people. Much valuable information could be obtained from a study not only of the defects, but also of the exaggerations and the inconsistencies in the insane and feeble-minded.

The possible difficulties of experimentation upon the insane and the mentally deficient may have kept some psychologists from attempting investigations. It may be said, however, that the difficulties have been greatly exaggerated, and such difficulties as there are may be readily surmounted. Opportunity for the careful and systematic study of patients may be obtained readily at many hospitals. Whatever former disinclination to the study of patients by "outsiders" medical men may have had has given place to a willingness to have careful experiments made to obtain a better knowledge of the psychical conditions in the mentally abnormal. The studies which are reported in this review indicate clearly that it is considered necessary to have general observations, such as are given by Solier,¹ analyzed, supplemented and verified by a careful study of cases by experimental methods.

The feeble-minded have been classified according to many different criteria—speech, moral and intellectual capacity and dulness, extent of mental faculties and attention—and the names designating the conditions have widely differed. Dagonet makes four classes: (1) Simple-minded, (2) imbecility, (3) idiocy, (4) automatism. Voisin has used the term "mental debility" in about the same sense as Dagonet's "simple-minded."

¹Psychologie de l'idiot et de l'imbecile. 2d Edit. Paris, 1901.

²Op. cit., p. 17

Sollier, who bases his classification upon the process of attention, divides the feeble-minded into three classes only: "(1) Absolute idiocy, a complete absence and impossibility of attention; (2) simple idiocy, a feebleness and difficulty of attention; (3) imbecility, instability of attention." In all cases Sollier says there is not only a diminution in quantity, but also a modification in quality of the mental faculties. Moreover, it may be added, all idiots present cerebral lesions and are thus further differentiated from normal people and imbeciles.

1. *Sensation*.—Several authors have cited the disturbances and aberrations of sensation as the cause of the lack of mental ability in some of the feeble-minded. It is undoubtedly true, as has been pointed out, that the absence or alteration of sense organs prevents the associational processes ordinarily concerned with these spheres, and to that extent there is a defect of the mental life. Blindness or deafness or the lack of other senses, or a combination of two or more defects in one person, does not necessarily produce an incapacity for the associations in other sensory motor paths. Sensory defects may contribute to, but they are probably not the greatest and certainly not the only factors in, the production of mental weakness.

Most idiots, Schleich found, are hypermetropic, while in normal children there is a tendency to myopia. Wylie (6) found in the children examined by him a visual dulness six to eight times the normal, and Kelly (12) in the pupils of the Physiological School (who are not described, but who are probably imbeciles), found poor vision. One-half were below the standard of keenness, and there was astigmatism in all but one or two. On the other hand, Sollier makes the general statement that "in imbeciles hearing as well as sight presents nothing abnormal." Schleich has defined the abnormality in the feeble-minded, but from the articles by Wylie and by Kelly it is impossible to tell what the differences are.

Owing to the incomplete color vocabulary of many idiots and imbeciles it is difficult to make determinations of the color sense. Jonckheere (11) and Kelly (12) agree that often color vision is defective. Kelly reports six out of twelve children with some kind of color blindness and one with total color blindness. Only two of Kelly's cases had an accurate color vocabulary, and the same deficiency has been noted by Jonckheere. Furthermore, Jonckheere states that in these cases it is very difficult to develop the sense (terminology).

Only two cases in the Physiological School were found to have normal hearing (12), but in other places nothing abnormal has been found (6 and Sollier, see above).

Taste and smell are very often dulled or perverted in the feeble-minded. The general statement is made that simple idiots are voracious and gluttonous, and that imbeciles are nearly all gourmands. Idiots will carry to their mouths anything which comes to hand just as very many normal children do—but, in addition, some will eat salt as if it were sugar. Stones, earth, sticks, bugs, and even excrement, are swallowed by those in whom taste is lacking or perverted. Of 66 children examined by the solutions of quinine, acid and salt 23 could not tell any difference, 16 responded to the bitter, 40 to acid and 22 to salt. Twenty of the brightest children averaged for threshold—sugar, 1.3 per cent. solution; salt, 0.48 per cent.; acid, 0.41 per cent.; quinine, 0.0177 per cent. (5).

The pain threshold is higher than in normal children (6 and 12), temperature threshold higher (12), touch dulled (6), and the double point threshold of touch increased 3 and 13), while the muscle sense is unusually bad (6 and 11). Wylie (6) found a dulness of the muscle sense, varying according to the general mental ability, and because of its importance in the education of the feeble-minded efforts are now being made toward a thorough training in this field.

Demoor (1) has found, and Claparède (9) has confirmed, a reversal of an ordinary weight illusion in cases of idiotism. When two masses of unequal size but of equal weights are lifted the smaller is judged the heavier. This illusion is found in children from the age of 6 or 7, and is constant throughout life in normal people, but in lower grades of idiotism a reverse judgment is given constantly in some cases, and in others the illusion is absent. The reverse illusion—called the “sign of Demoor”—is found in those cases which are incapable of education, and it has been suggested as a means of diagnosis of idiotism in its worst form. Claparède concludes from his study that “the presence of the weight illusion does not mean that the feeble-minded are of a teachable type, but the “sign of Demoor,” when present, speaks strongly in favor of idiotism.”

2. *Motor Ability and Fatigue.*—Motor training is the kind of education to which most of the feeble-minded readily respond and upon which depends much of their other teaching. If the movements are rapid and accurate and under fair degree of control, much may be hoped for in any attempt to improve their condition. Considerable attention has been devoted, therefore, to the study of motor ability, particularly in relation to school work in the hospitals.

Strength and steadiness (8), accuracy and rapidity of movement (12 and 13) are all less than in normal children, and the threshold of movement is larger (12). Experiments similar to those made by Fullerton and Cattell on the accuracy of perception of the extent of movement in 34 children of the Minnesota School showed no appreciable deviation from the normal (although the author concludes that there is an error of 2 to 10 times the normal) (7). All the experimenters found a very slow rate of tapping and arm movement (8, 12 and 13). Kuhlmann (13) obtained results of practice in accuracy—throwing at a target—but the curve is not regular and showed a decrease in ability so that occasionally it dropped to a point below which it had started. This is undoubtedly due, as the author points out, to decreasing interest; but when the interest is again aroused, as was done, the curve rises again.

The experiments on tapping—most rapid and continued movements—were examined for evidence of fatigue. Many of the subjects tapped at a very slow, but continued speed throughout the experiments, and it was difficult, sometimes impossible, to make them tap at a faster rate. The average maximum rate is very slightly above the normal rate. Some tapped faster at first and gradually decreased in rapidity, but neither Wylie (7) nor Kuhlmann (13) believes the decrease to be due to fatigue. Kelly attributes the result to a rapid fatigue, but disregards certain results. Of the children examined by him three showed an increase in tapping with the finger from the first to the last parts of the experiment, and four showed corresponding increases in rapidity with arm movements (12). The results would not lead one to believe that “fatigue with backward children, as would be expected from their low vitality, is very rapid and considerable” (Kelly, 12), but rather that “the lowering of interest and attention does not permit deduction regarding fatigue (Kuhlmann, 13).

3. *Attention.*—Most authorities agree that the lack of attention is the most common defect in the feeble-minded and the greatest hindrance to their education. If the attention can be sufficiently aroused and trained it is probable that other deficiencies will give place to a more normal condition. Since this matter is considered of such importance we should expect much time given it in the experimental determination of the condition in imbeciles and idiots, but unfortunately few of the experimental studies consider the subject.

The results of the experiments upon motor ability and fatigue reported above give some indication of the extent of the attention. Kuhl-

mann (13) compared the maximal and the normal rate of tapping, and found an average increase of only $1\frac{1}{2}$ taps per second when the attention was directed to make movements as rapidly as possible. (One subject showed a decrease in rate and another gave practically the same results in both sets of experiments.) The maximum rate is much slower than in normal children. When the subjects were told to tap in time with the beat of a metronome the accuracy was much greater during the first half minute than at any later time. It seems evident, therefore, that the attention was kept up for about 30 seconds. The esthesiometric tests of Consoni (10) show, in a uniformity of the double-point threshold, a considerable degree of attention to stimuli of one kind but when distracting influences were brought in—lights, counting blows on the other hand, counting the beats of a metronome, odors, tasting solutions, etc.—the threshold was much greater and much more varied than in normal children. The alterations in attention were found more prominent in the phrenasthenics of the most marked type. Consoni appears to agree with Sollier in his conclusion: the degree of general capacity of attention is in direct relation to the power of inhibition, and the examination of the attention furnishes a precise means for the estimation of the degree of mental weakness.

4. *Reaction Times*.—Twenty-two children gave an average of .388 sec. (M. V., .08) for touch reaction, 21 experiments each; and 16 children, for sound, averaged .293 sec. (M. V., .085), 24 experiments each. Eight Mongolian type averaged .396 sec. for touch (M. V., .095), and .360 sec. for sound (M. V., .113) (5). The individual averages and variations are not recorded, and it is impossible to tell how much variation there is in the group and how large the individual variation is. Wylie concludes, however, from the experiments that "long reaction times and high mean variations seem to be characteristic" of the feeble-minded.

In his experiments on association Wehrlin noted the time for giving the associations in one high-grade idiot and four imbeciles. One subject was found to give reactions as rapidly as normal people, but the other four were very slow. The average time in seconds for the associations to concrete words was found to be 3.4 sec., normal subjects 1.8 sec.; to abstract words, 3.7 and 1.9 sec., respectively; to adjectives, 3.5 sec. and 1.9 sec.; and to verbs, 3.3 sec. and 2.2 sec. (14 and 15). Wreschner has in one subject the times of about 1,000 association reactions, but these have not been calculated in a manner that makes them available (4). The average time in his experiments is about 3 seconds. The naming of ten object pictures, the distributing cards of different kinds, etc., were used to determine the time for discrimination, association and movement in the subjects examined by Kuhlmann (13). For naming a picture and distributing a picture card Kuhlmann found an average time of 1.48 and 1.46 sec., respectively. For distributing colored cards, 1.67 sec., and for form cards, 1.93 sec. The general average for the discrimination, association and movement for one card is 1.64 sec. In addition, the author made separate tests of discrimination time with dominoes, in which experiments the time was very long. No direct comparison is given for normal children.

5. *Association and Memory*.—As was to be expected, the associations of idiots and imbeciles are simple and not very varied. Wreschner (4) used as stimulus words, (a) adjectives descriptive of light and color, form and direction, movement, touch, temperature, hearing, smell, taste, pain and general sensations and esthetic feelings; (b) nouns—parts of the body, objects in a room, in a house, in a city, in the earth, botanical words, names of animals, members of a family, and occupations; (c) abstract words—with cheerful and sorrowful idea content, descriptions of feelings, will, understanding and consciousness, legal conditions and interjections. These words were used as stimuli ten times each. The associated words

which were given are noted in detail and the time in seconds for each association. These are grouped, classified and analyzed in detail. One is struck with the persistence of certain associations throughout the series of ten, and with the fact that there are so many purely sound associations. He finds that the relative number of sound associations for adjectives is 1:3.8; for concrete words, 1:0.7, and for abstract words, 1:0.9. The content associations take a longer time than the sound association, and this is particularly noticeable if the sound and content associations for the same stimulus words are considered. Only one case was tested by Wreschner, viz., an idiot. Wehrlin experimented on 13 idiots and imbeciles—average age, 40—with 58 to 290 experiments each. The simple character of the "associations" is evidenced by the following list of kinds or associations which were given (14 and 15):

1. Tendency to definition: *e. g.*, "year"—"12 months."
2. Tautology: *e. g.*, "run"—"a man runs"; "hair"—"beautiful hair."
3. Generalization: *e. g.*, "bread"—"edible."
4. Time, origin, use, etc., characterization: *e. g.*, "book"—"for reading."
5. General functions: *e. g.*, "wood"—"it burns"; "bird"—"it flies."
6. Examples and reminiscences: *e. g.*, "sick"—"I was sick"; "father"—"he threw me down stairs once."

Probably in no other single aspect of mental activity of the feeble-minded are there so varied differences as in memory. Many are unable to remember the simplest words, while others have remarkable memories for special things, *e. g.*, calculation, playing musical instruments, etc. Jonckheere (11) reports two cases of remarkable memory. An imbecile boy examined by him could recognize and name in French or German the disks for a music box with which he played, although he could not read. In this case there was a memory of the arrangement of holes in the disk, or probably of the design of the inscription. Another feeble-minded boy, who entered the school at the age of 9½ with only a German vocabulary learned in 3½ years French and the Flemish patois, and can recite in Dutch. Many of the children of the Vaucluse School have been found to compare favorably with normal children in their memory for numbers and words (copying 50 figures and two sentences); but idiots and imbeciles do poorly in all three tests (2).

Four numerals can be immediately repeated by many feeble-minded, and some can give five or six (12). Wylie tested the visual memory by having children pick out 5 cards (containing colors, letters or forms) previously shown to them, from a number, with the following average results: Form, 2.4 cards recognized; color, 2.4; letters, 2.6 (7). Similar results were obtained by Kuhlmann (13). The auditory memory was tested by repetition of six associated words, repetition of groups of sentences, and selection of five nonsense syllables, with the following results: Average number of words given correctly, 3.8; words in sentences, 11; nonsense syllables, 2.1.

6. *Miscellaneous Observations.*—All authors agree that the notions of time and space are very difficult to teach the feeble-minded (Sollier, Demoor and Daniel, and Jonckheere). Time is much more difficult than space, and past time much harder than future (11).

Like other mentally underdeveloped people, bright colors are most often preferred. Music with its rhythm has a wonderfully dynamogenic effect, and in some schools it is being used with excellent results in classes for gymnastics and motor training.

JELLIFFE.

THE NEURITIC FORM OF ALBUMINURIC RETINITIS. A. J. Ballantyne (The Ophthalmoscope, April, 1905).

The author draws the following conclusions:

First, the neuritic form of albuminuric retinitis is of rare occurrence.

Second, it is found usually in cases presenting severe cerebral symptoms, and may thus lead to suspicion of cerebral tumor. Renal disease must, therefore, be excluded before resorting to a diagnosis of cerebral tumor in such cases.

Third, it is probable that in most cases other slight retinal changes are to be found at some time or other, which would point to the renal origin of the condition.

Fourth, it occurs mainly in cases of advanced chronic interstitial nephritis, but may also accompany other apparently less advanced forms of renal disease.

Fifth, the condition of the nerve is probably of the same nature as the choked disc of intracranial disease, and like it, is to be attributed to increase of intracranial pressure.

Sixth, its occurrence suggests a grave prognosis, and is usually soon followed by a fatal result.

J. E. CLARK (New York).

SYPHILIS AND GENERAL PARALYSIS. Professor Fournier, at the Académie de Médecine de Paris.

Professor Fournier gives the following conclusions based on twelve cases in which the dates of the chancre were known. General paralysis does not occur in the first two years and rarely before the sixth, being most common in the period between the sixth and twelfth years. Cerebral syphilis in 223 cases observed occurred from the first year, and two-thirds of the cases within the first five years. He believes that insufficiency of treatment is chiefly responsible for the occurrence of general paralysis. Among 79 cases 5 per cent. occurred when the treatment was prolonged for three or four years, 15 per cent. with treatment from one and a half to two years, and 80 per cent. in cases treated for less than a year. He advocates prophylaxis by prolonged mercurial treatment, iodides having little effect. He proposes intense treatment for two years, with periods of rest, cessation of treatment for two years, and in the fifth year a second course of a year's duration, followed by a third course in the seventh or eighth year. He regards mercury as analogous to vaccine, and believes that the patient must be remercurialized to protect him from subsequent signs of syphilis.

JELLIFFE.

SYPHILIS AND GENERAL PARALYSIS. Stonziale (Gazette des Hopitaux, No. 8, 1905).

In 70 out of 100 cases of progressive paralysis, statistics of which were collected by the author, signs of syphilis were plain, and in 17 cases there were doubtful signs. In 32 cases syphilis was the sole etiological factor; in 38 it was associated with other causes, especially a neuropathic heredity and alcoholism. Histological examination in nine fatal cases of the cerebral arterial system revealed periarteritis and endarteritis due to syphilis. Intense mercurial treatment failed to modify the course of the disease even where the syphilis was evident and the paralysis not far advanced.

JELLIFFE.

KERNIG'S SIGN IN GENERAL PARALYSIS. Barcanne and Morcaux (Gazetta degli Ospedali, April 27, 1905).

Kernig's symptom is rather frequent in general paralysis, even in the early stages. The authors report 26 cases of general paralysis. This is important as excluding Kernig's sign from its pathognomic relations to meningitis. Irritation of the motor tracts near the base of the brain seems to cause this symptom in several conditions.

NOYES (New York).

PARALYSIS OF BOTH THIRD CRANIAL NERVES WITH DOUBLE OPTIC NEURITIS. A. N. Walker (Liverpool Medico-Chirurgical Journal, No. 46).

The author reports the case of a widow, 49 years old, who presented the characteristic appearance, both eyes being closed, the eyebrows up-raised and the forehead wrinkled from contraction of the occipito-frontal muscle. Upon raising the lids the eyes were seen to turn outward, the pupils being fixed and dilated. Examination with the ophthalmoscope showed that both optic discs were pale and the vessels contracted. The personal history noted an attack two years before the "inflammation of the bowels" with severe headache and vomiting, during which the right eye turned outward and closed. Six months after, the left eye did the same. She had had eleven miscarriages, and two children born alive. The author notes that double optic atrophy, without signs of disease in retine and choroid, points to atrophy consecutive to disease of nerve trunks. But complete paralysis of the muscles supplied by both third nerves points to interference with the latter rather than to a nuclear lesion. Probably the correct diagnosis was that of a syphilitic gumma at the base of the brain involving the optic nerves and the third nerves on each side.

JELLIFFE..

CHANGES IN THE NERVOUS SYSTEM INDUCED BY THE INJECTION OF THE GONOCOCCUS. Dr Osokin (*Die Medicinische Woche.*, Nov. 12, 1904).

Dr. Osokin, after commenting on the mistaken idea which obtained for so long that gonorrhea was a strictly local malady and one free from complications affecting the organism, whereas it has been proved that it leads to the occurrence of endocarditis, peritonitis, pruritus, stomatitis and to several maladies affecting the nervous system, reports the results of his experiments on guinea pigs, ten of which had been injected with cultures of the gonococcus, and ten others poisoned by gonococcus toxins. Of the first ten, three died, one following the eighth and the others following the seventeenth injection. Of the second ten, six died, one after the third, another after the fifth and four after the eighth injection. The remaining four were killed after the eighth injection. The injections were given each day. Microscopic examination yielded no uniform result. In many cases the changes in the spinal cord were marked, in others but slight. This variation is not easily accounted for, but it may be due to individual idiosyncrasy or to varying degrees of toxicity employed. In one case the chromatophores were greatly reduced. The author concludes that the entrance of the gonococcus into the animal economy may seriously affect the integrity of the spinal cord. At present, however, the evidence in hand will not permit an exact account of the action of the gonococcus on the nervous system.

JELLIFFE.

Book Reviews

PSYCHOLOGICAL MEDICINE. A Manual of Mental Diseases for Practitioners and Students. By Maurice Craig, M.A., M.D., M.R.C.P., Physician for and Lecturer on Mental Diseases, Guy's Hospital; Second Assistant Physician, Bethlehem Royal Hospital, London. P. Blakiston's Son and Co., Philadelphia, Pa.

Coming as this work does from Bethlehem, the old Bedlam of early English writers, it cannot fail to challenge the attention and demand more than a casual glance.

With the author's frequent insistence that mental diseases should be regarded from precisely the same point of view as other diseases, we are in hearty sympathy, but for an audience of alienists and neurologists this needs no special comment. We are also in accord with the author's repugnance to the words "lunatic" and "mad," and had hoped that he might have included the word "insanity" itself, as it has acquired the baneful accretions clustered about the former words.

The work in question is really for students—it is not a guide nor a lamp to the practised alienist, for as the author has expressed it, he has tried to fasten the old and the new psychiatry together, with the result of having fashioned a patchwork with all the evident seams and contrasting pieces.

The work in question is really for students—it is not a guide nor a lamp to their pupils in Germany, of Ballet, Soques, Grasset and others in France, does not allow of the mode of handling that the author has attempted. Whether he has written as he has from motives of expediency or from lack of courage to attempt the coördination of the old with the new is not apparent, but we cannot escape the conviction that from the philosophical standpoint he has fallen between the proverbial two stools.

When the author tells us that mental diseases are to be considered as any other type of disease, and then says that general paralysis is not an insanity, but is a nervous disease in which the damage to the brain causes mental disorder, it is evident that he has not broken away from the "pigeon hole" conception of disease in general, and fails to make it evident in his writing at least that he appreciates the general current that views the functions of the mind as processes rather than as categories. If the different toxic psychoses, as in lead poisoning, pneumonia, typhoid, etc., are not "insanities," but nervous diseases with mental symptoms, where are we? But as already hinted at, the word insanity is a medieval relic, and we believe should be abandoned. We can appreciate what he would attempt to show, but rebel at the idea of the human body being a series of acre lots with dividing walls between.

From the clinical point of view the book has many admirable points, and is a commendable one to put in the hands of students. Furthermore, the chapters on sleeplessness, general symptomatology are excellent.

For a handy school manual the work is well worth while, and the author is to be commended for his attempt to bring the old psychiatry in line with the new.

JELLIFFE.

PHYSICIAN'S VISITING LIST FOR 1906. P. Blakiston's Son & Co., Philadelphia, Pa.

About this time of the year the profession begins to look for the annual issue of this convenient visiting list, by means of which the busiest physician may keep a complete account of his professional affairs and the

most careless and accurate one. The present issue has all the usual characteristics of arrangements for compact and clear accounts in substantial and neat leather binding.

GOODALE.

PASSAGES FROM THE DIARY OF A LATE PHYSICIAN. By Samuel Warren, THE DOCTOR'S RECREATION SERIES, Volume VI. Edited by Charles Wells Moulton, Saalfeld Publishing Co., Chicago, New York and Akron, O.

This piece of fiction which so closely imitates fact is written in the characteristic fashion of the early nineteenth century, to which its author belonged. Lawyer though he was, his early study of medicine enabled him to produce a "diary" which justly sets forth the struggles and achievements of an English physician of his day, albeit with that "artistic heightening" which is permissible under such circumstances. The Editor has arranged it attractively for the readers of a later generation, and the nature of the work permits the several incidents to be presented in different chapters without much effort at continuity. Altogether it is a worthy addition to the interesting series in which it appears.

GOODALE.

WHARTON AND STILLE'S MEDICAL JURISPRUDENCE. Volume II. Poisons. By Robert Amory, A.M., M.D., and Robert L. Emerson, A.B., M.D. Fifth Edition. The Lawyer's Coöperative Publishing Company, Rochester, N. Y.

As a modern work on poisons, we cannot feel that this work is a success. Although we are told that the book has been rewritten, it is hard to tell whether this refers to the present time or to ten years ago, for of modern toxicology in the sense of Pouchet, Kionka, Schmiedeberg or Kunkel we find only faint traces here and there. Robert seems to have been the latest real authority.

We would not attempt to convey the idea that there is nothing up-to-date in the book, for there is much excellent material, but the old and the new are in impossible juxtaposition. One finds in places the latest knowledge of the synthetic chemist rubbing elbows with worn-out neighbors.

The book still suffers from too much of the old dead wood. Thus, on page 539 we read: Strophanthin, its alkaloid, and three inches below strophanthin is a glucoside. Even a proof-reader might have queried this statement. Antipyrin, acetanilid, phenacetin are all termed anilines, and are treated as identical in their action. Modern pharmacology teaches that antipyrin is a pyrazolon, and is quite dissimilar in its action on the blood. Antipyrin does not ordinarily cause hemolysis. In fact, we find very scant references to the modern studies—not so very modern—of Kionka and others on the blood poisons and the rationale of their actions.

Wood alcohol is up to date, Reid Hunt's recent work having been included. This seems to have been an accident, being a new subject. Of the general correlation of the alcohols and of Myers', Overton's and Heinz's studies not a word, and they stand as the foundation of our comparatively recent studies on narcosis, now at least five years old. We are told that the picture of alcohol poisoning (p. 449) is much like that of opium or apoplexy—truly as indefinite as it is inaccurate.

It is a great pity that the work was not rewritten entirely, especially from the interpretative style. The symptoms of actual poisoning can stand, but when it comes to the interpretation of many of the symptoms there is much conflict.

We feel that this book can only tend to make much more mischief for the toxicological expert.

JELLIFFE.

LES TUMEURS DE L'ENCEPHALE. MANIFESTATIONS ET CHIRURGIE. Par le Doctor Duret, Professor of Clinical Surgery at Lille. Felix Alcan, Paris. G. E. Stechert, New York.

The present volume of nearly 850 pages is an analytic and synthetic review of the subject, with many original views that are of more than passing moment.

In the opening chapters the author, in gathering together a great number of observations and in their interpretation, has endeavored to point out a symptom-complex at once diagnostic and concise, taking into special consideration the composition, variations and pathogeny of brain tumors. He has indicated the part played by compression, by increased cerebral tension, by intoxication, edema, by vascular distention, disturbances of collateral circulation and lesions at a distance.

In a second part the general symptomatology of cerebral tumors is taken up. These include the general symptoms, the motor and sensory disturbances, the affects of speech, of intellectual activity, reflexes and equilibrium. These are all discussed in the light of their diagnostic importance, and the methods of examination spoken of as well. Localizing symptoms are also taken up in this chapter.

A third part discusses the diagnosis, particularly from the standpoints of differentials, of localization and of type of tumor. Thus, attempts are made to differentiate between tuberculous, syphilitic, cystic, gliomatous, sarcomatous and other forms of tumors.

A fourth part deals with the surgical treatment of these tumors. The work is an invaluable one for the surgeon as well as the neurologist.

JELLIFFE.

DIE MULTIPLE SCLEROSE DES GEHIRNS UND RÜCKENMARKS. Ihre Pathologie und Behandlung klinisch bearbeitet von Dr. Eduard Müller. Gustav Fischer, Jena. Paul Hoeber, New York.

Müller has given us a practical and thorough monograph on multiple sclerosis, a disease which year by year we are realizing is much more common than has been formerly supposed. It is a commendable piece of work, founded as it is on pathologically-controlled studies, as well as on clinical material.

After a short historical résumé, Müller considers the etiology of the affection. To this he contributes little that is new, and follows the interpretations of Hoffmann and others who have in recent years added to our knowledge on this point. He differentiates two groups in the general concept of this disease type, one a multiple sclerosis *per se* in the narrow sense, a second in which perhaps the majority of the cases may be arranged, secondary multiple sclerosis in the sense of Schmaus and Ziegler, following a number of exogenous or endogenous injuries to the central nervous system.

Of the various etiological features he leans naturally to Strumpell's embryonic histogenic doctrines, but does not entirely exclude a number of the so-called causes, particularly with reference to the secondary types of multiple sclerosis. So far as trauma is concerned, Müller says that he does not believe that trauma alone can be a cause of the true type of this disease. It is not impossible in his belief that trauma may greatly accelerate the development of the clinical symptoms of the disease. The infectious micro-organisms may be responsible in large part for the Schmaus-Ziegler type of secondary multiple sclerosis.

The symptomatology is discussed at great length and most admirably and philosophically handled. Not only are the symptoms described, but the author devotes considerable space to the elucidation of the physiological and pathological groundwork that makes the symptom-complex possible. The sections on nystagmus are admirable, and clear differentials are suggested with reference to true nystagmus and the nystagmoid movements of tire, muscle involvement, etc.

On the anomalous and well-developed forms considerable stress is laid, and this chapter, and that on the differential diagnosis, are the best we have seen in any treatise on the subject.

The pathological anatomy is written on at considerable length and, as the author himself has had exceptional opportunities to follow up his clinical observations to the autopsy room, his contributions are especially worth while.

The prognosis is bad. It is true that cures have been reported, but faulty diagnosis, particularly hysteria and myeloencephalitis, as well as long remissions, must be considered in estimating the true status of these cures. That the disease may rest for a very long time is highly probable.

Naturally, the treatment offers little, yet the author's suggestions concerning the elimination of certain initiative factors are well worth considering.

This is certainly a work that every neurologist and psychiatrist should have.

JELLIFFE.

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Original Articles

PROGRESSIVE MUSCULAR ATROPHY; A STUDY OF THE
CAUSES AND CLASSIFICATIONS, WITH THE
REPORT OF AN AUTOPSY.*

BY CHARLES L. DANA, M.D.,

OF NEW YORK.

The present paper is a clinical study of the records of 72 cases of progressive muscular atrophy, of bulbar or spinal origin. It includes none of the muscular dystrophies, but only those forms of muscular atrophy which are progressive in character, and are degenerative and central in origin, viz., progressive ophthalmoplegia, bulbar paralysis, amyotrophic lateral sclerosis, and the various types of spinal progressive atrophy whether beginning in the arms, legs, shoulders, or hip girdle. I have added the record of one case of progressive bulbo-spinal palsy and tabes, with autopsy.

There are three points which I have studied especially, in connection with these histories, and which I wish to present for discussion:

1st. The clinical classification of these cases.

2nd. The etiology and, especially, etiological relation of syphilis to this disease.

3rd. The question of the proper status of so-called "chronic anterior poliomyelitis," and its relation to the atrophies.

CLASSIFICATION.—As regards the classification, the status of *amyotrophic lateral sclerosis* has, perhaps, caused the most discussion, in the past, amongst neurologists. In my list I have histories of only three cases of progressive muscular atrophy, be-

* Read at the meeting of the American Neurological Association, June 2, 1905.

ginning with symptoms of spasticity, and accompanied by this condition very dominantly, throughout its course, with all the objective evidences of sclerosis of the lateral columns. These cases, while undoubtedly closely related, and pathologically identical with other types, have such distinct clinical features, that the use of a special term to designate them, seems to be sufficiently justifiable. If, however, I add to this list of three, all the cases of progressive muscular atrophy which were later associated with *some signs* of spasticity, and *some evidence* of the lateral cord involvement, the number would be 14. Of these 14, four began with symptoms of the ordinary type of progressive bulbar paralysis, and only after some months developed spastic symptoms. Two others began in the legs and ascended to the arms, shoulders and bulb, developing late spastic symptoms, while five more began in the hands and arms, simulating at first, perfectly, the ordinary type of the Duchenne-Aran atrophy, but later appearing like cases of amyotrophic lateral sclerosis.

Thus, cases beginning in the same way progress, some with and some without developing spasticity. It seems, therefore, a rather unnecessary confusion of symptomatology to transfer the diagnosis of progressive muscular atrophy, of the Duchenne-Aran, or other type, to that of amyotrophic lateral sclerosis, as soon as a little evidence of spasticity begins to show itself, especially as there was nothing peculiar either in age, course or duration. In one patient, for example, the atrophy began in the hands, and ascended to the shoulders, when there was some evidence of lateral cord involvement. The disease was then arrested, the spastic symptoms disappeared, and the patient now presents a type of Duchenne-Aran atrophy, without any spastic symptoms. I should therefore, I repeat, limit the use of the term, "amyotrophic lateral sclerosis," to those cases which show only from the beginning and dominantly, the spastic and contracturing types of progressive muscular atrophy.

Progressive Bulbar Palsy and Progressive Ophthalmoplegia.—There is a very close similarity in the etiology, course and termination of those cases which begin in the arms and then ascend to the medulla, and those cases which begin in the medulla or ocular nuclei and then descend and involve the hand, arm and legs. I have found that all my cases of progressive bulbar paralysis and

ophthalmoplegia, if they lived long enough, showed, eventually, signs of a spinal muscular atrophy also.

Thus I have the histories of two cases of progressive ophthalmoplegia; the disease showed a descending course, involving the mid-brain nuclei, then the medulla, and then the spinal centres, until the whole of the oculo-motor, bulbar and spinal motor neurones were involved. One-half the cases of progressive bulbar palsy, starting in a most typical manner, with dysphagia, dysarthria, developed eventually, or almost simultaneously, symptoms of involvement of the arms and legs, and sometimes, associated spastic symptoms. I have now a patient who has in the last six months slowly developed a glosso-laryngeal atrophic palsy and left-hand atrophy without spasticity. I see no reason, therefore, for not including under one name, all forms of progressive muscular atrophy, and separating them, if we must, for purposes of convenience, into those types which begin in the eyes, the bulb, the cervical or the lumbo-sacral cord. According to this method, I find amongst 72 cases, three of amyotrophic lateral sclerosis, there being over 55 of the other form. Of this 55, eleven began in the mid-brain or bulb and descended, while 33 began in the arms, and 4 in the legs and ascended.

It will be seen that the cervico-bulbar (or Duchenne-Aran) type of progressive muscular atrophy, far exceeds in frequency, any other form, and a certain amount of spasticity develops in these, in about 25 per cent. of the cases.¹

¹ There is a curious similarity between the methods of onset in the whole group of cases, including bulbar paralysis and progressive muscular atrophy, on the one hand, and in those of amyotrophic lateral sclerosis alone, on the other. Thus, in a list of 81 cases of the latter disease, collected by Collins, the upper extremity was affected in 39 cases, or about 50 per cent. the lower extremity in 14 cases, or about 12 per cent.; hemiplegic and all four extremities in 11 cases or about 8 per cent., and in the bulb in 21 cases, or about 25 per cent.

In 40 cases of my own, the disease began in the upper extremities, in 17 cases, the lower extremities, in 7 cases, and in the four extremities and hemiplegically, in 13 cases, and in the bulb, in 13 cases.

DANA.		COLLINS.	
ALL TYPES.		AMYOTROPHIC.	
Bulbar and eye	13	Bulbar	21
Cervico-spinal	17	Cervico-spinal	39
Lumbo-spinal	7	Lumbo-spinal	11
Quadruplegic and hemiplegic	13	Quadruplegic and hemiplegic ..	11
<hr/>		<hr/>	
40		82	

The attempts to group the cases as those of amyotrophic lateral

So far, therefore, I make out essentially only one kind of progressive muscular atrophy,—and this includes amyotrophic lateral sclerosis, ophthalmic, bulbar and spinal progressive palsies.

Progressive Occupation Atrophies.—There is, however, a group of cases, which seem to me to run a somewhat special course. They are those which begin in the shoulder girdle, and then pass to the hip girdle, or *vice-versa*. Then they may slowly extend to the trunk and extremities. They occur in rather young people, and in almost all cases can be attributed to occupation, combined, perhaps, with some excesses that otherwise deteriorate the constitution. They run a much longer course than the other forms of atrophy, and there occur periods of arrest. They show very marked fibrillary twitchings, and the usual absence of degenerative reactions, until late in the disease. They are not associated with any lipomatosis, nor any family history of atrophy, nor history of syphilis, nor are there in connection with their atrophies, any of those peculiar vascular and trophic disturbances, which are usually associated with the progressive muscular dystrophies. They give no evidence of sensory trouble or those degenerative reactions which occur in progressive atrophies of peripheral, nervous origin.

I have no sections which will prove that they were not dystrophies, however, and in their slow course and relatively benign progress, they bear some relation to them. They may be, perhaps, simply classed as “progressive occupation atrophies” that have become extensively spread, and owing to a weakened or defective constitution, they acquire a slowly progressive character. Their clinical recognition and differentiation is justified on the ground of their better prognosis. One of these cases which occurred in the person of a professional contortionist, will illustrate the character of the trouble better than any general description.

sclerosis on the one hand and as cases of progressive spinal muscular atrophy on the other was found impossible, for the cases with spastic symptoms begin and run their course in very different ways.

Thus, of 15 cases beginning with bulbar or eye and bulbar symptoms, only 2 developed later typical spastic symptoms like those of amyotrophic lateral sclerosis.

Of 23 cases beginning in the arms like a Duchenne-Aran type, six developed spastic symptoms later.

Of 12 cases beginning in the shoulders or thighs and shoulders, 4 developed spastic symptoms.

Of 12 beginning in the legs, or hemiplegically, 2 developed spastic symptoms.

PROGRESSIVE OCCUPATION MUSCULAR ATROPHY.

James De L., aged 27, white, Irish, admitted to Bellevue Hospital, March 22, '97.

Family History: Mother died of consumption—otherwise negative; has four brothers and three sisters, all well.

Previous History: He cannot recall being sick at any time previous to the present trouble. His father was a horse-trainer in a circus, and he was brought up to be a contortionist as far back as he can remember. He had a brother who was a contortionist, and was perfectly well up to the latest information. He had no syphilis, no gonorrhea previous to the present disease; but he did drink from one to two pints of whiskey daily for a period of about five years.

Present Illness: In Nov., 1886, while performing, he fell from a trapeze and injured his back. This was followed by great weakness and pain in the back. There were no spinal pressure symptoms, and he otherwise felt all right. He went to St. George's Hospital, London, and remained in bed ten weeks. Four weeks after his entrance a plaster of Paris jacket was applied and extension to the limbs was given as they "jerked up" a good deal. The jacket he wore four months in the country where he went to grow stronger. The jacket was then removed and he returned to his profession, feeling as strong as ever. He remained perfectly well and performed his duties as usual for four months. One night as he was going to perform he noticed his former pain in the back and found he could not do his work. This was nine years ago at the age of 18. He has not been able to do anything since. The history since that night is as follows: Pain in back continued for five or six years; it was worse on exercising, but was scarcely felt on resting. Both the shoulders began to atrophy in four months, followed soon by the arms and forearms. These atrophied to their present condition, in about 12 months, then stopped. Following this he had three years of respite, then he noticed his waist growing thin; this was soon followed by thinness of calves. He was able to walk, however, up to 12 months ago; since then he has been in a wheel-chair. His general condition during this time has been good, except for periods of severe headaches, lasting three days sometimes and associated with blurred vision, swelling of eyelids and nausea and vomiting. He had no other sensory symptoms. He came to America two years ago, and three months after came to Bellevue, where he remained one and a quarter years.

Physical Examination.—Patient is poorly nourished. Tongue coated slightly. Subcutaneous fat seems present in good quantity, skin soft and moist. Arms, thighs and waist markedly wasted. Lungs negative. Heart action good. Loud systolic murmur heard over base and transmitted upward. Liver and spleen negative.

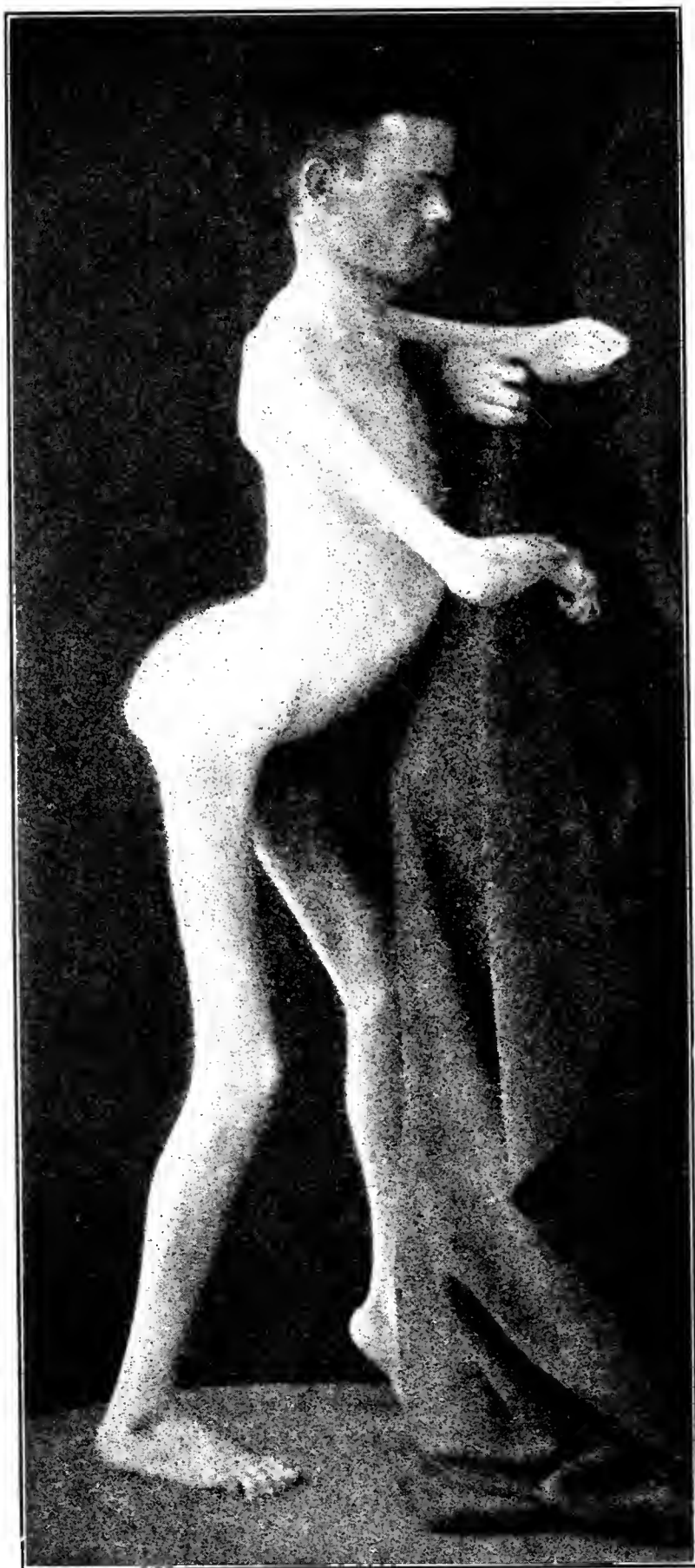


Fig. 1.

Nervous System.—Mental and cerebral symptoms absent.

Sensory—touch, temperature, space, pain, location, position, form, normal. No anesthesia, hyperesthesia or paresthesia.

Motor.—Muscles of forearms, calves, buttocks, trunk, face and neck firm, but small and atrophied, though he has some voluntary motion in all except the *erector spinæ*. There are fibrillary twitchings in the muscles of thigh and calf. The rhomboidei are markedly atrophied, giving winged appearance to scapulæ. Pectorals are much atrophied, so that ribs in front are very prominent. There is a marked anterior-posterior curvature of spine, convexity forward, in the lumbar and lower dorsal region. Respiration is normal, and he does not use accessory muscles. Sphincters normal. Face and masticatory muscles normal. Muscles of hand not atrophied. Has some talipes equino-varus. Although patient cannot stand, he still manages to dress, etc., without any assistance, making one hand help the other, etc.

Electrical Examination.—Forearms, lessened galvanic reaction. Arms, thighs, calves, rhomboids show degeneration reaction. Face and hand muscles normal.

Comparative Measures.

Left arm, 2 in. above elbow	Forearm, 2 in. below elbow..
5¼ in. circum.	7½ in.
Right 5½ in. circum.	7¾ in.
Left Thigh, 4 in. above knee.	Calf, 4 in. below knee
9 in.	10 in.
Right 9 in.	10½ in.

This shows the arms and thighs to be smaller by ½ in. than the forearms or legs. It is a so-to-speak "root-joint" atrophy.

Vaso-Motor.—Lower part of legs cold and bluish; no trophic disturbance except in muscles.

The disease slowly progressed, and the patient finally died of an intercurrent disease without involvement of medulla. Total duration of disease about eleven years.

Chronic Anterior Poliomyelitis.—There is another type of progressive muscular atrophy which deserves, I think, more attention from American neurologists than it has received, viz., that characterized by what we might suppose to be a chronic anterior poliomyelitis.

There seems to be a great difference of opinion amongst neurological writers, as to the actual existence of any such disease as this. I have, myself, seen and reported one case in which the lesion was confirmed by autopsy (*loc. cit.*), but it was a subacute rather than chronic disorder. Starr, in his recent work, puts progressive muscular atrophy under the head of chronic anterior poliomyelitis, while I have simply classed under this name, the

chronic cases of acute anterior poliomyelitis, not thinking one justified in recognizing as a special disease the subacute and chronic poliomyelitis of Duchenne.

The literature of the subject, as given in the "Handbuch der pathologischen Anatomie des Nervensystem," is limited to 11 references. To this may be added a case of my own, reported with Dr. Biggs (JOURNAL OF NERVOUS AND MENTAL DISEASE, June, 1887), male, 53, gradually atrophic paralysis, of six months' duration, ending in death. Central myelitis with cavity. Also one reported by J. B. Charcot "L'atrophie musculaire progr.," 1895,² p. 115. Nonne, in 1891, analyzed previous cases, 5 in all, and made out of these five, three types:

1. Circumscribed, reaching a certain stage and remaining stationary (Eisenlohr's).⁴

2. With rapid atrophy and paralysis, with tendency to regression and cure (Landouzy-Dejerine).³

3. A chronic, steadily progressing, atrophic paralysis, with or without involvement of peripheral nerves (Dreschfield, Oppenheim, Nonne).⁵

In Nonne's case and Oppenheim's there was a progressive degeneration of the anterior corneal cells and a slight involvement of the lateral white columns, but *no inflammatory reaction*.

In none of these cases, except perhaps Eisenlohr's and my own, was there any inflammation, and the condition was distinguished from a progressive atrophy by its more rapid course (about two years), and the fact that atrophy preceded the paralysis.

The situation, as regards chronic and subacute anterior poliomyelitis, then is about the following:

1. Some cases reported as such, in the past, were cases of multiple neuritis.

2. Other cases were those of a subacute, atrophic paralysis, running a course of about two years or less, and due to a rather rapid cellular degeneration, not to inflammation. In other words,

² In Charcot's case there was no history of syphilis, but the autopsy showed marked vascular lesions. He states that a sclerosis of the anterior fundamental column is characteristic of this disease.

³ Landouzy-Dejerine, Rev. de Méd., 1882, No. 2, 12.

⁴ Eisenlohr, Neurolog. Centralbl., 1882, No. 18.

⁵ Oppenheim, Archiv. f. Psych. xix, Hft. 2, 1888.

⁵ Dreschfield, Brain, 1885, July.

⁵ Nonne, Deut. Zeit. für Nervenheilkunde, Vol. 1, p. 138. 1891.

they were really cases of progressive atrophies, so that this rapid course is not a diagnostic criterion.

3. There are, however, some clinical cases (none as yet with autopsy so far as I know), in which paralysis and atrophy affect certain cell groups, in a relatively active fashion, i.e., in a few weeks. The disease then stops, and later another group of nerve cells is attacked in the same way, and later a third or fourth. We have in these a clinical picture, which corresponds to a subacute poliomyelitis. They are probably cases of *cellular degeneration from vascular disease (syphilitic?)*.

There is then, I conclude, not yet established on a sure pathological basis, such a disease as a true chronic or subacute inflammation of the anterior horn-cells of the spinal cord. The cases so reported, are instances rather of subacute degenerative processes, secondary sometimes to vascular disease, and are probably related to the progressive, spinal atrophies. Degenerative change may occur rapidly and destroy nerve cells in a few months as well as in five or six years, and this fact explains the reports of clinical cases, diagnosticated as "chronic poliomyelitis anterior."

These *subacute progressive atrophies*, however, should be recognized clinically, and it is probable that the process is due to vascular disease primarily, and is of specific origin.

I have two cases illustrating this kind of "*subacute, remittent spinal atrophy*." In one case the patient had a gradual development, in two or three weeks, of a paralysis of one leg, associated with some irritative symptoms, leaving the leg weak and atrophied. After some months or a year, the arm on the same side became affected, then the other arm, and then the other leg, finally leaving him in a condition of chronic atrophic paralysis. In the other case the patient became affected with a subacute motor paralysis of the shoulders, developed in the course of two or three months; this became arrested, and then after a year, another series of segments of the spinal cord, higher in the neck, became affected in the same way, leaving the patient in a few weeks with a further development of his atrophic paralysis. It was, like the other, a remittent, progressive atrophic paralysis.

One of these cases was presented to the New York Neuro-

logical Society, by Dr. Hunt, as representing a form of subacute poliomyelitis anterior.

These patients showed fibrillary twitchings, they developed spastic symptoms, and they have all the general symptoms of ordinary progressive muscular atrophy, but the paralysis was, at least, a little in advance of the muscular atrophy, and there were evidences of the involvement of other parts of the spinal cord than the anterior horns,—such as the lateral fundamental columns and the pyramidal tracts.

In both my two cases of this remittent disorder, there was a very unmistakable history of syphilitic infection. I think it likely that some of the other cases which have come under my observation, if it had been possible to watch them closely for a long time, would have shown a progress somewhat similar to this. So that, it seems to me, apart from the true progressive spinal atrophies, there may be yet developed a type of *recurrent subacute poliomyelacea*, which should be separated from the ordinary groups, and it will further be found that *syphilis* is perhaps the infection which is the cause of this form of atrophic paralysis.

I append summaries of the histories of these cases :

Subacute Progressive Atrophy, coming on in successive attacks.

Case I. H. M., male, age 40, English, boiler-maker, lues in 1889, with secondaries, and but little treatment. No alcoholism or lead. In January, 1901, weakness, stiffness and atrophy in left upper arm and shoulder. In August, 1902, same process in the right arm and shoulder. Admitted to the hospital at that time, with atrophic paralysis of both shoulders and upper arms, the parts involved being the biceps, brachiales antices, deltoid, spinati, supinators and pectorals,—the left side worse than the right; exaggerated knee-jerks, ankle-clonus and Babinski. Fibrillary tremors. Patient's condition remained stationary for about a year. In February, 1904, the same process began to involve the extensors of the neck, so that the chin fell on the chest and could not be raised (Fig. 2). At the present time he has atrophic paralysis of upper arms, shoulders, and posterior neck muscles, with slight exaggeration of reflexes; no ankle-clonus. Pupils are of the Argyll-Robertson type. He has had no anesthesia or pain, but has had slight feelings of numbness in shoulders and arms. Patient's condition has since second attack remained nearly stationary for about a year.

Case II. P. D., male, 39, single, waiter, Irish, alcoholic excesses; lues in 1892 and secondaries. In 1895 began to lose power in right leg with atrophy. In 1896 same process in right arm and shoulder. After an interval of several months, the left arm and

shoulder, and after another interval of several months, the left leg and then trunk muscles became involved. Finally, in 1899, four years after the attack began, the medulla became affected. The disease began each time with a sense of weakness, some fibrillary twitchings, and crampy, painful sensations. Paralysis and atrophy followed. The process recurred at intervals, until in two years all

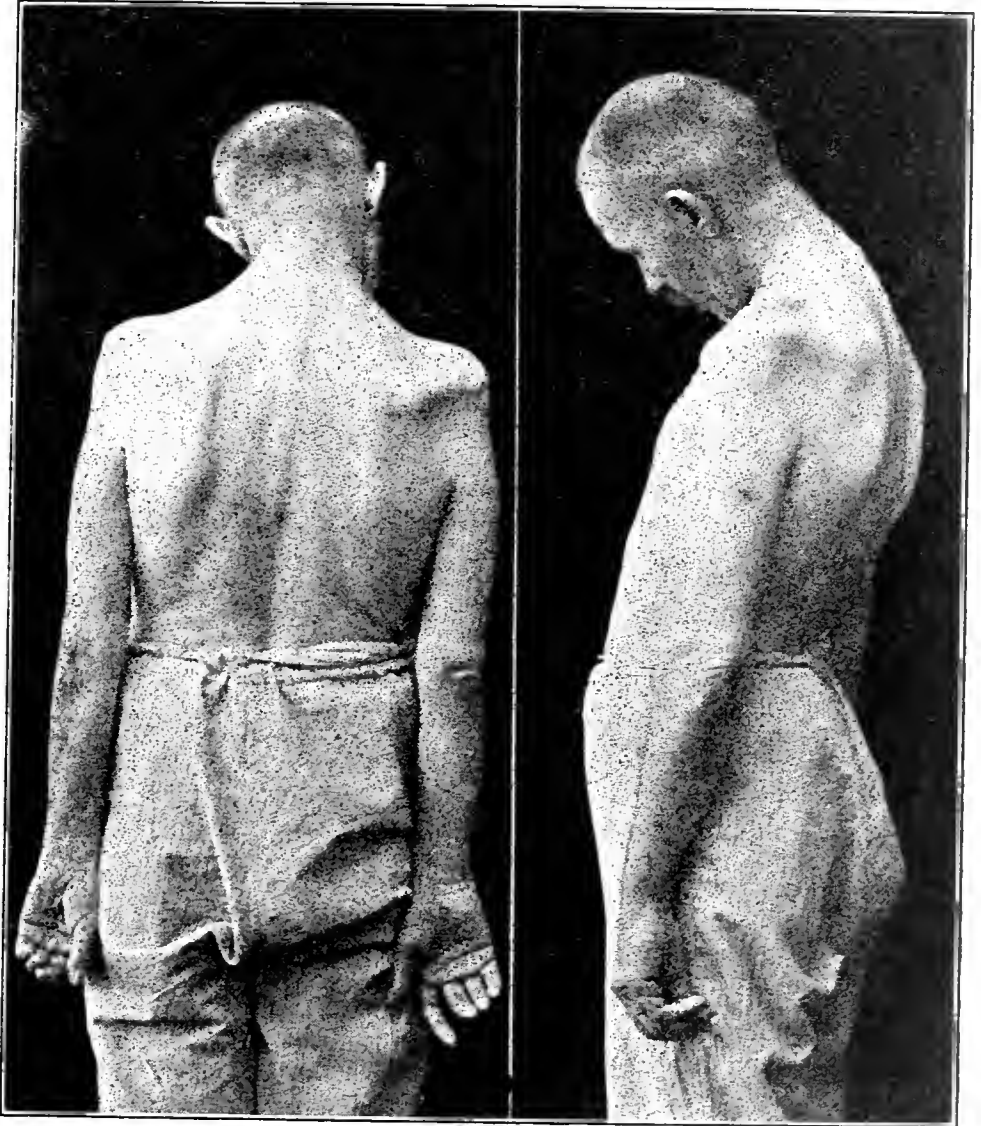


Fig. 2. Case of Subacute Remittent Progressive Muscular Atrophy. Patient is unable to raise the head.

four extremities were involved, and in four years the trunk muscles and bulb.

We have then three kinds of progressive muscular atrophy of central origin:

1. The Bulbo-spinal type including ophthalmoplegia, bulbar

palsy, cervico-spinal (Duchenne-Aran) atrophy and the various leg types.

2. Progressive occupation atrophy, slower in course with a tendency to affect the shoulders, trunk and hip-girdle more than the legs and forearms.

3. Subacute anterior poliomyelacea coming on usually in remittent attacks and probably of specific origin.

ETIOLOGY.

(1). *Syphilis and Progressive Muscular Atrophy*.—With regard to the relation of syphilis to progressive muscular atrophy, the facts that I have to furnish can soon be given, and I believe that they are, at least, more than suggestive. I have seen so many cases of progressive muscular atrophy that were so distinctly parasyphilitic, that it seemed to me we might infer that nearly all the atrophies were due to this process. Amongst my 72 cases, 19 gave a history of syphilis, which would give a percentage of about 25 per cent. Leaving out the shoulder-hip type, which seemed to belong to a different category of disease, the presence of syphilis as the cause of progressive muscular atrophy of all forms, would be greater and probably if the antecedent history were more definite in all cases, the percentage would receive another increase. It will be remembered that the investigation into the syphilitic origin of tabes, began with rather modest statistics in its support. In none of my three very distinctive cases of amyotrophic lateral sclerosis, was there a history of syphilis. On the other hand, in 33 cases, beginning in the arm and hand, and of the ordinary Duchenne-Aran type, there were 9 cases. Among the 14 cases, associated with spastic symptoms, there were 3 cases of syphilis, and in the bulbar or bulbo-cervical type, of which there were 11, there were 3 cases, while in 5 of the hemiplegic type, there were two cases.

In all types, therefore, whether beginning in arms, legs or medulla, the percentage of syphilis seems to range about the same, which would be another confirmation of their pathological unity. Of the parasyphilitic cases, three were associated with the early symptoms of tabes, and one with symptoms of paresis. In 2 cases, persons who had had an old infection of syphilis, had developed atrophies in the arm and hand, of a very slowly progressive type. The late and degenerative influence of the syphil-

itic poison, may therefore show itself primarily in the form of a progressive atrophy of a perfectly typical kind, or it may show itself in the form of a locomotor ataxia, with a mild grade of progressive muscular atrophy, slowly progressing, and imposed upon the tabes.⁶

Since writing up my statistics, I have read the paper of Lari (*Arch. de Neurologie*, Vol. XVI, 303) who reports 30 cases of amyotrophic lateral sclerosis with syphilitic history and cites the case of a physician who suffered from amyotrophic lateral sclerosis, and who was cured by antisyphilitic treatment. It may be that the same vigorous early treatment of progressive muscular atrophy on anti-syphilitic lines, will help to arrest some cases of this dread disease.

I append here a case of this kind:

Case of Tabes and Bulbar Spinal Palsy.

L. B., age 60. French, teacher. Admitted March 30, 1903. Mother died of acute phthisis, otherwise comes of long-lived, healthy stock. Moderate use of wine, beer, cognac and absinthe; four to six cigars daily. 40 years ago epididymitis-gonorrhea. One year later (39 years ago) had a sore on penis—cauterized; no secondaries, no constitutional treatment. 25 years ago acute articular rheumatism. 22 years ago jaundice, probably catarrhal. Has been an uncommonly healthy and active man, and a great talker.

Present Illness.—Six months ago his customary walks caused him fatigue and pain in back; this was quite severe, but was relieved at once on sitting down. Exertion also produced dyspnea. At the same time, difficulty in enunciating distinctly, developed especially in pronouncing *l, r, n*; a little later there was trouble in masticating and swallowing large pieces of solid food, and his throat felt narrower than usual. He soon noticed weakness in the upper extremities—the small muscles of the hands being first

⁶ Among 19 cases in which there was a history of syphilis the patients were all males, and ranged in age between 33 and 60, most being about 40. There were in some a contributing history of alcohol, tobacco, overwork, or trauma. In 4 the disease was associated with tabes, and of those 4, one began as a bulbar palsy, the trouble extending through to the spinal cord. In the other three the disease began in the arms like a Duchenne-Aran type; in two of these the process was arrested, the luetic infection being a very old one.

In 8 the disease became associated with spasticity and exaggerated reflexes and clonus. In one it began in the shoulder girdle, in one in the legs, in the other 5 it began in the hands and forearms, and in all but 1, eventually involved the medulla.

In 2 cases the disease came on in the leg, arm and shoulders of one side and in 1 case remained hemiplegic in type.

In one case a patient after an infection had tabes for 20 years, then developed bulbar palsy and died.

affected, so that delicate movements, as shaving and writing, became difficult. The extensors of the forearm and hips also became weak and atrophic. He had difficulty in walking. Vertigo occurred on rising suddenly. On admission to the hospital he complained of pain in back, dyspnea was so great on exertion that he could hardly walk a block. Dysarthria was marked, and he had to use semi-solid or liquid nourishment. Smell, taste and vision normal; *g, l, r, x*, difficult to enunciate. Motor weakness—atrophy of shoulder girdle—fibrillary tremor present. Legs showed no marked atrophy. There was diminution of pain and touch sense in the fingers. The wrist and triceps jerks were absent; the knee jerks and ankle jerks were very feeble.

No Babinski. No Romberg. Sphincters normal. Argyll-Robertson pupil present. He suffered from characteristic darting pains in legs. Pulse temp. and resp. showed nothing of note.

Later notes, by Dr. J. R. Hunt.—Patient is a tall, round-shouldered and slightly-stooped, but healthy-looking old man, with white hair and ruddy complexion. He walks with marked eversion of feet (due to old Potts' fracture of right leg.) Speech is thick and articulation indistinct, with marked laryngeal hoarseness. For five years hardness of hearing (slight) on both sides, but this has not increased noticeably during present illness. He has at times a distinct girdle pain. Pulse 75, regular, good quality, no tension, no thickening. Heart, no murmurs, no accent. Lungs moderate, general bronchitis.

Cranial Nerves.—3, 4, 5, 6, and 7 nerves are normal. The orbicularis oris is defective, noticed in forming labials; cannot whistle as formerly or blow out a candle.

On innervation of the palate a weakness is quite apparent. It is not lifted in normal fashion—the movement is better on the left side. Uvula is practically normal. On protruding tongue, a marked atrophy is apparent, the surface is wrinkled and corrugated, and the seat of constant fibrillary twitchings. The larynx is lifted readily during the act of deglutition. No respiratory and no cardiac symptoms. There is atrophy and weakness of the muscles of the shoulder girdle—is unable to lift arms high above the head. The muscles of the upper arm and forearm are fairly strong. The hands are weak and the thenar eminences appear slightly atrophied. Power of legs about normal—no atrophies. The knee-jerks and Achilles jerks are lost. Triceps jerks present, but not exaggerated. The jaw-jerk is active. The right pupil is wider than the left—stiff to light and accommodation. No vesical symptoms. Very slight Romberg. Small areas of analgesia over legs.

The patient's condition at first improved. He then grew steadily worse, the bulbar symptoms predominating and he died at the end of four months, his disease lasting less than a year.

Autopsy and Histological Examination by Dr. Hunt.

Brain.—The arteries of the circle of Willis are practically

normal. The basilar shows arterio-sclerosis and the walls are thickened, but nowhere occluded. The middle cerebrals on both sides are the seat of well marked arterio-sclerotic changes (not occluded.) The roots of the hypoglossal nerves are distinctly smaller and thinner than normal (atrophic.) Otherwise, the inspection of the brain was negative. The pons and medulla were cut in series of sections, and each alternate section treated in alcohol (Nissl.) and Müller (Weigert.)

Microscopical.—Atrophy and degenerative changes are present in the 12th nerve nuclei and the motor nucleus of the glosso-

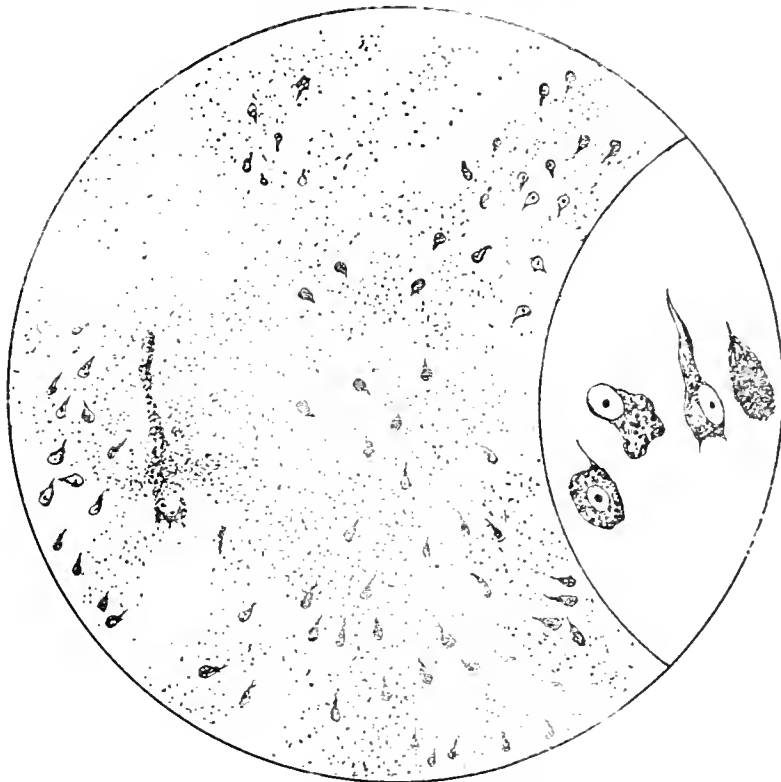


Fig. 3. Bulbar palsy and tabes, nucleus of hypoglossal. The dark cells are nearly obliterated with pigment, x2-3. To the right are four cells in different stages of degeneration, x1-6.

pharyngeal-vagus. The changes are more marked, and more striking in the 12th nerve nuclei.

Types of cells and degenerations noted were:

I. Atrophy without distinct cell destruction, the staining being intense.

II. Hyaline appearance, structureless. Rounded outline, no processes or internal structure apparent.

III. Fragments, the outline and general arrangement of which alone indicate its cellular origin.

IV. Cell rounded—no process, nucleus, protoplasm and pigment present.

V. Shrunk and vacuolated cells.

No changes noted in the other nuclei of the medulla or pons.

Weigert-Pal. The pyramidal tracts, the ascending roots of the trigeminus and the glosso-pharyngeal are normal. The root fibres of the hypoglossal nerves are atrophic, and to less extent those of the glosso-pharyngeal, which are pale and thin. The blood vessels of the medulla and pons are moderately thickened, no obliterations. The meninges moderately thickened. No foci of round-cell infiltration or other evidences of inflammatory change.

In the lower portion of the medulla as the posterior

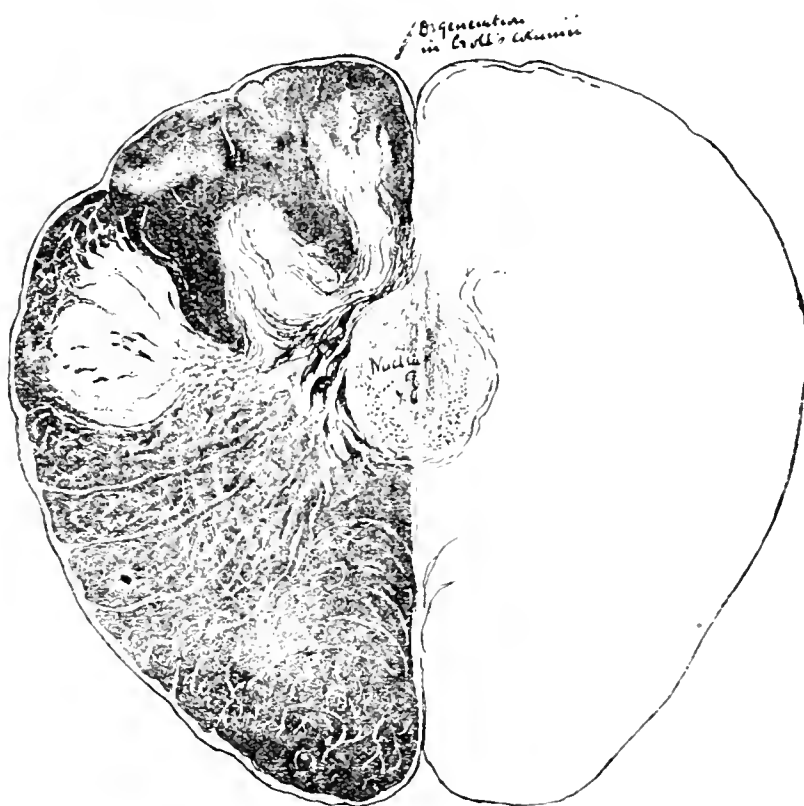


Fig. 4. Section of medulla in cases of bulbar palsy with tabes. The section is very normal except for the cell atrophy.

columns enter the nuclei of Goll and Burdach an *apparent* paling of the column of Goll is present posterior to the nucleus of Goll, by the Weigert-Pal method (Fig. 4). The neuroglia is increased in this region, some fibres lack a myelin sheath, and some are represented by empty sheaths. These changes are not present in the columns of Burdach and may represent mild tabetic changes, ascending degenerations in the columns of Goll, although the fibres of this column are noticeably small and the *glia proportionately* increased.

GENERAL ETIOLOGY.

With regard to other points in the etiology, my statistics correspond, in general, with those that have been made by others.

As regards race, it has seemed peculiar that there should be so few instances of the spinar form of atrophy in the Hebrew race, in which race there are so many cases of the dystrophies, I found no records of this malady, in the Montefiore Home, during the last fifteen years.

With regard to age, I have seen two cases beginning as early as the twelfth year, of the Duchenne-Aran variety, in the most characteristic form. In one case, which I have now watched from the time it began, at the twelfth year, to the present time, the patient now being 24, the disease was arrested, after about four years of progress, the patient being left with simply an atrophy of the left forearm, in the muscles of the ulnar distribution. My oldest patient was one of a perfectly typical arm type of atrophy, seen with Dr. J. Arthur Booth, occurring in a physician, aged 72, but beginning probably, before his seventieth year.

The period during which the greatest number of cases were seen was that between the 30th and 40th years and next, between that of 40 and 50. In cases of bulbar paralysis, the age of 53, seems to be a singularly serious year. I note the occurrence of six cases at about that period of time, amongst 12 in all. There were about five times as many cases among males as among females, but this does not apply to all types of the disease. In the bulbar cases, there were more women, the proportion being 8 to 4.

Amongst the exciting causes, by far the most frequent is that of some form of strenuous occupation. Workmen who had to do very heavy work, athletes or professional contortionists, were among the victims, and in the cases of bulbar paralysis, there was several times a history of the patients being very great and excessive talkers. Lead, as a cause of paralysis, does not seem to me after all, as important a factor as has been supposed. It could be blamed for the disease in not over five cases, and not certainly, in all of these. Several of my patients were very heavy users of tobacco, but I fancy this was only a coincidence. Two patients had in infancy a previous attack of poliomyelitis. In one case there was a very distinct history of an acute infection by dengue; it is not improbable that other cases have followed an acute infection. In one instance, for example, the patient seemed to develop

the trouble after a severe attack of the grip, and it has occurred to me as being not unlikely that the progressive muscular atrophies, which are not due to any specific infection, directly or indirectly, may be due to some degenerative influence of another toxin. In other words, where they may not be parasyphilitic, they are parainfective diseases.

Résumé—All groups of central progressive muscular atrophy not due to tumor, are essentially the same disease, in genesis, course and underlying pathological condition, except that we may separate the progressive occupation atrophies, and certain subacute atrophies. Amyotrophic lateral sclerosis though pathologically and essentially of the character as the other atrophies may receive a separate name on account of its clinical and anatomical peculiarities. The grouping would be then

Progressive Muscular Atrophy (ophthalmoplegic, bulbar, cervical, lumbo-sacral).

Amyotrophic Lateral Sclerosis.

Progressive Occupation Atrophy (not the ordinary limited and arrested type).

Subacute Progressive Atrophy (often recurrent and usually syphilitic).

Progressive Muscular Atrophy is most often excited by prolonged muscular over-exertion. It is in one-quarter, at least, of the cases, parasyphilitic, and in others parainfectious.

APPENDIX.

DUCHENNE-ARAN CASES.

Among 20 cases of the Duchenne-Aran type, there were males 17, females, 3. The ages at onset were:

10-15	3	41-45	1
16-20	1	46-50	0
21-25	2	51-55	4
26-30	1	56-60	1
31-35	2	61-65	0
36-40	4	66-70	1
			<hr/>
Total			20

Excessive exertion was noticed in 6.

Excessive use of tobacco in 3.

Syphilis in 8.

In these cases the disease did not reach the bulb while under observation.

Shoulder-Girdle and Hip-Girdle or Root-Type.—This included the cases of so-called chronic occupation atrophies but some were apparently only ordinary progressive muscular atrophy in which the forearms and hands, legs and feet were not involved or but slightly. There were 7 in all, 6 males and ranging in age from 22 to 50, most being between 30 and 50. The distinctly occupation cases ran a much slower course and as stated the trunk muscles became involved. In all but two cases the trouble began in the shoulders and arms. Fibrillary twitchings were present. The knee-jerks were absent where the thighs involved; in other cases exaggerated or normal, but there was no clonus. In none had the bulb become involved. One case was under observation 8, and one 7 years.

SYPHILIS.

The distribution of the syphilitic cases is shown in the table. It is most common in the high palsies, absent in the occupation cases, and in the amyotrophic lateral sclerosis cases. Dr. Collins writes me that he found a syphilitic history in 2 out of 9 cases.

In one case a tabes of specific origin and of long duration ended in bulbar palsy. In one case tabes and bulbar palsy ran together, the bulbar palsy being the dominant thing. In one case tabes and cervico-spinal types ran together.

Syphilis is much the most common in the bulbo-spinal types and all my cases were in men.

HEMIPLEGIC TYPES.

Of the hemiplegic types there were 6 cases. They were 5 males and 1 female. The ages ranged from 26 to 56. There was a history of syphilis in 2 and of lead in 1. The disease began in the leg and then in the arm in 3 cases, in the arm and then in the leg in 2 cases. In 3 cases the trouble was on one side only while under observation. In one case the bulb was finally involved, this being a syphilitic case with absent knee-jerk. In another case not syphilitic the knee-jerks were feeble and the ankle-jerk gone on the affected side. One of these cases presented the history of a subacute or chronic poliomyelitis (see history).

The case had increased knee-jerks but no clonus, and amyotrophic lateral sclerosis was supposed to be developing. Fibrillary tremors and wasting were present in all.

TABULAR SUMMARY.

I		Male	Female	With Tabes	Syphilis	Spastic Cases
I	Progressive ophthalmople- gia ending in bulbar spinal atrophy	2	0	0	0	2
	Progressive bulbar palsy, including cases later in- volving arms and legs ..	10	4	2	4	14
II	Duchenne-Aran cases without later bulbar in- volvement,	27	6		9	5 33
	With bulbar involve- ment,	11	2		6	2 13
III	Hemiplegic and other types	3	0	0	0	3 3
	Typical amyotrophic later- al sclerosis					
IV	Occupation: Dr. Shoul- derton's type	6	1	—	0	0 7
	Totals	59	13	—	19	14 2

HYSTERICAL STIGMATA CAUSED BY ORGANIC BRAIN LESIONS.*

BY HERM. H. HOPPE, A.M., M.D.,

OF CINCINNATI, O.

PROFESSOR OF NERVOUS DISEASES, UNIVERSITY OF CINCINNATI (MEDICAL COLLEGE OF OHIO); NEUROLOGIST TO THE CINCINNATI HOSPITAL.

In introducing for your consideration the subject of the origin of hysterical stigmata in organic brain diseases I am fully aware of the fact that I offer nothing new, but I am actuated by the desire of helping along the movement of trying to trace all of the so-called functional diseases to an organic basis.

In treating of the nature of hysteria and commenting upon the fact that it is a psychosis, the majority of writers are carried away by the idea that the mind is something wholly apart from the brain, and that mental aberrations are wholly independent of physical changes. As our knowledge increases we find more and more that functional use is attended with physical changes; even abstract mental activity is accompanied by increased metabolism, as is proven by an increase in the consumption of oxygen, and an increased exhalation of carbonic acid gas. We know that the child is born with all the faculties of the soul latent; that as the brain develops and as the general and special senses carry impressions to it the soul gradually develops the faculty of intellect and will, and in old age these faculties deteriorate when the brain itself undergoes retrograde metamorphosis. I need refer only to progressive paralysis of the insane to show how the soul or mind is deprived, one after the other, of its faculties until finally the individual is reduced to a vegetative existence.

That there is an interdependence of mind and body is perfectly apparent, but the manner or kind of relationship is still beyond our knowledge, most authorities assuming the doctrine of a psycho-physical parallel: that psychic phenomena go hand in hand with certain physical conditions, and that the perfection of the former is dependent upon the physiological and anatomical integrity of the latter.

*Read at the meeting of the American Neurological Association, June 1, 2, and 3, 1905.

Before the seventeenth century the wandering uterus played a great rôle in the etiology of hysterical symptoms. The French in the seventeenth century first looked upon the brain as the seat of hysteria. Up to the middle of the nineteenth century hysteria was looked upon as a reflex neurosis. To-day the opinion is universal that hysteria is a general neurosis. Charcot, in developing his doctrine of the relation of hysteria and hypnotism made clear the relation of some of the symptoms to certain psychic changes. But Schultze emphasizes the fact that the psychology of hysteria demands much further elucidation and investigation.

If hysteria is a psychosis, then we must admit that while many of its manifestations are due to localized disturbances of cortical functions, the cortex of the entire brain is affected in its manifestations.

Psychic activity which represents the highest and most complicated manifestations of life demands of the neurone not only the highest development of structure, but also of function.

We are unable to-day, in a measure at least, to solve the physiological problem of changes in the neurone on which psychical manifestations are based. We know that the neurone reacts to external stimuli in two ways which are opposed to each other.

In the first place, stimulation of a neurone produces *external* manifestations of neuronic activity, which show themselves in muscular contraction, heat production, secretion, etc.

In the second place, stimulation affects the neurone in such a way as to limit or curtail the energy produced.

These effects are respectively known as the conducting and the inhibitory activity. Both of these activities are dependent upon definite bio-chemical and bio-mechanical activity.

Verworn holds that the protoplasm of the ganglionic cell consists of numerous living molecules of albumin, which are constantly performing either positive or negative molecular work, and sometimes one and sometimes the other predominates. The positive molecular activity manifests itself in an oxidation process, viz., the using up of the protoplasmic molecules in the production of the specific impulse of the cell. The negative molecular action is one of assimilation, a synthetic process, namely, the building up of the complex chemical molecules of the neurone.

Fatigue and exhaustion, we shall see, result from an excessive positive molecular activity, recuperation from an excess of nega-

tive molecular activity. Usually a neurone is at the same time under the influence of both stimuli. Its activity shows itself either in the nature of urging on or increasing an impulse which is already generated, or in diminishing the force of such an impulse.

The collision of two impulses in the same neurone is called "the interference of the stimuli." The circumstances which determine the result of such an interference, whether there shall be an increase or a diminution of activity, depends upon the condition of the neurone.

In a normal condition of the neurone the result of such an interference is usually inhibition; in an exhausted neurone there is usually an increase of irritability or activity.

The manifestations of a normal neuronic activity are always, therefore, somewhat inhibited.

Abnormal neuronic activity may either show itself in the form of an explosion or its activity may be entirely absent, due either to a complete exhaustion caused by a want of working capacity or it may result from complete inhibition due to the excessive manifestation of the "interference of stimuli."

Wundt says that in every central neurone we must distinguish physiologically between a central zone and a peripheral zone of the cell.

The central zone (nucleus) is the seat of negative molecular activity, viz.: anabolism and the peripheral zone is the seat of positive molecular activity, viz., katabolism. Any stimulus reaching the central zone increases the negative molecular activity, which is inhibitory in character, and causes this activity to overflow over the peripheral zone; and *vice versa*, any stimulus acting upon the periphery of the zone increases positive molecular activity, which produces increased activity and causes it to spread over the central zone. The central zone, according to Wundt, corresponds to the origin of the axis cylinder fibrils, whereas, the peripheral zone corresponds to the origin of the protoplasmic masses of the dendrons. I will not go into the theories and experiments calculated to study and demonstrate the generation of impulses in the single neurone, but will call your attention to careful experimental work, showing the effect of functional activity and fatigue upon the structure of the ganglion cell. In this respect the work of Guerrini stands out most prominently.

Guerrini took twelve dogs and placed them in an apparatus similar to a squirrel's cage and made them travel distances varying from 21 to 60 miles. Some of these animals were killed at once and others, used as control animals, were fed and allowed to rest before being killed. Both groups of animals were examined in precisely the same manner, same methods, stains, etc. The control animals were found to be perfectly normal. In the fatigued animals organic changes were found in the gray matter of cortex and cord, but especially marked in the psycho-motor area. These changes were as follows:

1. Enlargement of the peri-cellular lymph space, due to a diminution in the size of the cell body.
2. Accumulation of leucocytes in the peri-cellular lymph spaces.
3. Changes in the achromatic network of the cell body.
4. A dissolution of the chromophile masses.
5. Vacuoles in the protoplasm.
6. Irregularity in the contour, and a diminution in the size of the nucleus.
7. Vacuoles in the nucleus.

Hodge made similar experiments on the spinal cord of cats. He stimulated the motor root with an electric current on one side, and therefore had the opposite anterior horn always present for the purpose of control. He not only found all the above changes of Guerrini, but proved that these changes were directly proportioned to the length of the period of stimulation of the nerve-trunk; and that after ten hours of stimulation the nucleus was diminished in size 44 per cent. Hodge also examined the nervous systems of birds, bees, sparrows, swallows and pigeons in the morning after a night's rest, and at night after a day's work, and found the above differences between normal cells and cells showing fatigue.

The above changes in the ganglionic cells have also been studied in the living cell. The sympathetic nerve of a frog fed with a nutrient plasma was put under a microscope, stimulated with electricity, and the above cell changes were noted as a result of this stimulation.

It has also been shown that the above fatigue changes occur early and in a more profound manner if the nutrient plasma is not normal, but is changed by inorganic mineral poisons, the poisons of cymotic diseases, perhaps alcohol and urea, which it is needless to say is borne out by our every-day experience in practice. It has been found that if these cellular changes went be-

yond a certain degree it was impossible for the animal to recover completely. That excessive fatigue was accompanied by permanent changes in the structure of the cell.

Now what practical bearing have these researches upon the organic basis of hysteria.

Hysteria, notwithstanding the fact that it has been known and described from the dawn of medical times, is a disease whose real character is in many respects even now wrapt in obscurity. This is primarily due to the fact that hysteria manifests itself in the realms of the mind, not in such a manner as to show marked aberrations of the intellect, but in anomalies of character and emotions. Its innermost nature is masked by boundless and an unending variety of bodily symptoms of illness.

Its signs and symptoms are found to be interlaced with, exaggerating or masking, the signs and symptoms of all other diseases.

The primary fact which confronts us in contemplating the nature of hysteria is that it must be based upon a defective organization, upon molecular changes in the protoplasm of the gray matter of the cortex.

Charcot and his school represent the extreme view that the primordial cause, compared to which all other causes are exciting causes only, is heredity. Hysteria is a distinct family disease, handed down usually from mother to children, although it may descend through the father. In the ascendancy of the hysterical subject we can, as a rule, trace nervous affections which need not always be hysteria, but some other functional neurosis.

While this opinion of Charcot is almost universally held to-day for ordinary hysteria, it does not hold for traumatic hysteria. Oppenheim, than whom there is no better authority on this special subject, is of opinion, and every man who has seen many cases will agree with him, that the majority of cases following accidents occur in individuals who have previously been entirely healthy, and in whose family history no trace of nervous diseases can be found. Therefore, in these individuals some change in the gray matter of the cortex which has produced this altered condition of the emotions, as well as the hysterical stigmata, must have been acquired as a result of the accident.

Hence, we can conclude that whatever may be the underlying

change in the cortex of the brain in hysteria, it may either be inherited or acquired.

Charcot and the French school incline more to the psychic nature of hysteria, comparing hysteria to the artificial state produced by hypnotism.

Solier has lately advanced the theory that hysteria is a state of somnambulism which, instead of enduring for a few minutes or hours, continues in hysterical persons for days, weeks and even months (Vigilambulism). These conditions of lethargy may affect the brain as a whole, or they may affect isolated motor, sensory or visceral areas of the cortex. In proportion as there is a slight or deep, a general or localized degree of somnambulism, we have slight or marked localized or general manifestations of hysteria. This theory of somnambulism or sleep presupposes that state of the cortex which leads to sleep, and we can easily imagine a state of the ganglion cells similar to that found by Guerrini in dogs, and by Hodge in birds, cats and insects.

In hysteria we have a pathological state of the nerve centers whose chief clinical manifestation is an incoördination of brain functions, where the emotions influence the will power more strongly than is normally the case.

Oppenheim's explanation of the nature of hysteria brings us closer to our anatomical ideas of the disease. He says that "the nature and origin from which all hysterical phenomena spring is an irritable weakness of the nervous system, an abnormal irritability, and an abnormal exhaustibility of the gray cortical centers." This affects all the functions of the nervous system, but shows itself first and most actively in the sphere of the emotions.

Both external and internal stimuli produce greater emotional effects in the hysterical than in the healthy. The manifestations of hysteria upon the motor, vaso-motor, secretory and sensorial functions are merely an exaggeration of what occur under ordinary physiological conditions. The effect which the emotions usually have upon these various functions is modified by education, practice and will power. That the emotions do affect these various functions, and that there is a close relation between them, is seen, for instance, in the mimical contractions of the facial muscles during laughter or crying, the shedding of

tears, the blush of shame, the pallor of anger, the tonic muscular contraction of anger, the trembling of fear.

The effect of the emotions upon the various functions depends partly upon the stimulus producing the emotion and partly upon the state of irritability of these various centers. The response is pathological when the effect is out of proportion to the cause, and the fundamental cause of an excessive effect is an irritable weakness of, and a consequent abnormal ease, with which the motor, vaso-motor, sensory and secretory functions are brought into action.

The pathological phenomena of hysteria are merely an expression of increase in the physiological action of these centers. The laughing and crying fits of the hysterical correspond to the laughing and crying of the healthy; the general convulsions find an analogy in the trembling of fear, in the tonic muscular contractions of anger. Irritations which the normal individual does not perceive at all, or which at most produce a sense of discomfort, produce in the hysterical pain, paresthesia, globus and increased rapidity of the heart's action.

All signs and symptoms can be explained by an irritable weakness, an abnormal exhaustibility of function of the brain cortex. I have given you Oppenheim's views as to the nature and origin of hysterical phenomena rather extensively because they coincide with my views on the subject, and because, if they are true, they take us one step nearer to a solution of the question upon a basis of the results obtained in animal experiments.

If irritability and abnormal exhaustibility, a lack of mental and emotional inhibition are characteristic of hysteria, we may assume that the same protoplasmic changes of the ganglionic cells which we assume to be present in neurasthenia are also present in hysteria, for we know that hysterical manifestations are in inverse proportion to the health of the individual. The better the general health the less manifest the symptoms. The greater the exhaustion, the greater and more certain the effects of suggestion, even in hysteric experiments. The greater the exhaustion the more numerous and more tenacious the symptoms and signs.

Let me introduce at this point two cases:

Case No. 1.—Mrs. A., light mulatto, has never borne chil-

dren. Has been nervous since 1893, when she was injured in a railroad accident. Recovered from this accident completely after six months.

Denies syphilitic infection, although she bears evidence of syphilis in nodes and pigmented scars.

Has never had hysterical convulsions or hysterical stigmata.

On Dec. 12, 1902, while sitting and talking she was seized with a feeling of numbness in the right hand and arm, fell from her chair to the floor and was unconscious for a few minutes; when she recovered consciousness she found that she was unable to speak, and that her right side was paralyzed. On the next day she was able to speak a little, and there was some slight movement in the limbs. Was brought to the neurological department of the Cincinnati Hospital on the third day.

On admission, patient gave the above history; was not aware of the existence of any sensory disturbance further than that the side was numb.

Examination.—Female, middle age, well preserved; some copper-colored spots about the size of a silver dollar over both tibia.

Intelligence good, no speech defect, somewhat emotional, and desirous of much attention and sympathy.

Slight ptosis of left eyelid, left pupil smaller than the right. Pupils normal in reaction to light and accommodation.

No defect in the external muscles of the eyes.

Field of vision not tested.

Right labio-nasal fold absent, right angle of mouth lower than left; on opening mouth right angle of mouth depressed, left drawn upward. Tongue protruded toward the right.

No spastic condition of tongue or face.

Almost total paralysis of right arm.

Right leg can be moved, but is very weak.

Reflexes, both radial and patellar, are much diminished on right side, normal on the left side.

There is complete analgesia of the right side of the body, going sharply to the median line of the scalp, the middle of nose, chin, sternum and abdomen in front and on back down along the spinal processes. This analgesia affects the entire right side of the body. The sense of touch is present. There is also a complete loss of temperature sense. Stereognostic sense lost in the right hand. Muscle sense defective in fingers and toes, but normal for limbs.

Sense of smell and taste are normal.

During the next ten days there was a gradual improvement in the hemiplegia, but the sensory disturbance remained unchanged. Daily attempts to remove the hemianesthesia by mere verbal suggestion were ineffectual. After two weeks of failure by verbal suggestion a strong Faradic current was used. A

promise was made that the electricity would put new life in the affected side. Vigorous contractions were produced in the region supplied by the facial nerve and brachial plexus, and was followed by quick return of sensation in the right side of head and arm, both for pain and temperature. The current was not applied to leg, and although the sensation improved, it was not until the next day, when the leg was also treated, that the sensation returned to a normal condition.

In the presence of the class the hemianesthesia was reproduced on two occasions by suggestion, and made to disappear again by the use of the Faradic current.

On the tenth day Babinski sign was marked in right foot, absent in left. Became more marked after return of sensation.

One month after onset of hemiplegia well-marked ankle clonus of right foot; patient is still able to walk; tongue is protruded slightly to the right, paresis of right side of face almost completely gone. Marked weakness of right leg. To sum up in a few words:

Onset, with apoplexy and short loss of consciousness of a right-sided hemiplegia, tongue, arm and leg, gradually decreasing with development of increased reflexes; Babinski sign and ankle clonus in the fourth week.

Complete hemianesthesia for pain, temperature and partly of muscle sense, which remained unchanged for two weeks, and then was made to disappear completely and almost instantly by the combined verbal and electrical suggestion.

The patient is most positive in her statement that the disturbance of sensation did not exist before the attack of apoplexy, although she was sharply questioned about the injury to the left shoulder joint ten years before. She stoutly maintains that the sensation was perfectly normal.

Case N. 2.—Cerebro-spinal syphilis with hysteria. Henry Y., aet. 38, single, waiter. Entered Cincinnati Hospital Jan. 24, 1905; complaint, weakness of legs. Denies syphilis; has had ordinary diseases.

Trouble began four weeks before admission. Weakness of right leg, felt weak; he was compelled to walk in the way described below, and he could not change his gait as long as his mind was occupied with his right leg.

Had double vision; incontinence of urine when great necessity for urinating was present.

Examination.—Mental condition apprehensive, fear of paralysis.

Pupils unequal, do not respond to either light or accommodation. Ptosis of right eyelid, weakness of right side of mouth, no disturbance of sensation of face or tongue. Arms normal.

Weakness of both legs, especially the right. Increased reflexes, ankle clonus of right side, Babinski both sides.

Patient had a peculiar gait, which resembles the "two-step" dance, and is known as the "two-step man."

The organic symptoms rapidly diminished under the anti-syphilitic treatment. After three weeks the gait became normal, and has never had a recurrence of the dancing movements. To-day the pupils react normally and all organic signs have disappeared, with the exception of a slight spastic paresis of the right leg, with ankle-clonus, but notwithstanding this the "two-step gait" has never recurred.

The combination here of a hysterical gait superimposed upon a mild case of cerebro-spinal syphilis cannot be doubted. The interesting feature is that the entire condition was not looked upon as hysterical, a mistake easily avoided by making a careful examination.

It is needless to say that the diagnosis of hysteria alone would have been a calamity to the individual, who is well to-day and has returned to his usual occupation.

My object in introducing for your consideration the subject of the origin of the stigmata of hysteria from organic brain insults is to call your attention to a probable development of hysterical stigmata upon an organic basis.

We know that functional aberrations of ganglionic cells are due to some changes in the protoplasm of the ganglionic cells. For function of cells and chemical change are inseparable, combustion, oxidation of substance, using up of molecular parts, metamorphoses, are the physical basis of function; constructive and destructive metamorphoses are always going hand in hand; like in neurasthenia, we can assume that in hysteria there is a defective anabolism, either inherited or acquired, which leads to an imperfect organic state of the nerve cells. The ganglionic cell, either from its origin is structurally imperfect or it acquires a structural imperfection. Added to this condition is another which, while in itself is more or less an intangible condition, is dependent upon the protoplasmic perfection of the cell itself.

Each perfect cell has the inherent power of metabolism, of katabolism and anabolism, both of which are regulated by some unknown agency, which is perhaps inherent in the nature of protoplasm. In hysteria this function of metabolism is defective in two ways: in the first place, the reconstructive ability of the protoplasm of the cells is defective, either inherited or acquired, and in the second place, the protoplasm is irritably weak. There is a lack in the cell itself of normal inhibition. The function of the cell is either dormant or it does not act at all. There is an

exhaustion of function and the protoplasm fails to produce energy, or we have the other manifestation; the energy produced, instead of being regular, rhythmic and sustained, occurs in the nature of an explosion. Both of these changes in cellular function, either a diminution or absence of function or an explosion of cell energy, are dependent upon an irritable weakness of the cell, which in turn depends upon a state of diminished nutrition, of structural imperfection. We know now, as a result of careful investigation into the physiology and pathology of nerve cells by numerous observers, that these organic changes of the nerve cell are brought about by ordinary daily work, by exhaustion and by various poisons and toxins, which are apt to be found influencing our bodies in every-day life, normally; and this has been proven experimentally, the cell protoplasm recovers from these organic changes as a result of taking food and rest. Thus in all the above experiments the changes noted in the cells were absent in control animals, birds, insects, after the normal period of rest.

But it has been proven by experiment that there is a certain point produced by exhaustion beyond which recovery does not take place, or only after a long time, and then imperfectly. These experiments would correspond to our clinical experiences, with neurasthenia, which we might term a chronic condition of exhaustion resulting from long-continued over-exertion, inadequate nutrition, inadequate rest, in which repair has not equalled consumption, and in which a lowered state of the organism as a whole has weakened, even under favorable conditions, the ability of the protoplasm to establish a normal metabolism and a normal balance of conservation and expenditure of energy.

In hysteria, I should imagine that this change in the organic structure and in the physiological balance of protoplasm is fundamentally the same as it is in neurasthenia, except that it is exaggerated. We see clinically in hysteria the same exhaustion, the same irritability of function; hysterical individuals are always neurasthenics, but they have neurasthenia to a highly exaggerated degree, with the added burden of inheritance. The pathological picture which I draw for myself of the organic basis underlying hysteria is that we simply have more profound protoplasmic changes in the cell, plus a greater degree of weakness of anabolism, leading to constant physiological irritability of

function, manifesting itself either in exhaustion or explosion, or an excess or incoördination of physiological inhibition. This depends either upon an inherited or acquired defective condition of the protoplasm of the ganglionic cells of the cortex, not only of those presiding over the functions of motion, but also of general and special sensation or association, but especially of those ganglionic centers which preside over the vegetative and generative functions, of circulation, respiration, digestion, excretion, etc. This defective general state is either inherited or acquired, and the functions of the ganglionic cells are so enmeshed in the vicious circle of defective nutrition of protoplasm and excessive expenditure from functional incoördination that it is impossible for the system to establish a physiological and structural balance.

Rapidity of change, both psychical and physical is not necessarily opposed to the view of a molecular change in the ganglionic cells. These same characteristics are typically present in neurasthenia, and we can see only a difference in degree between the manifestations of neurasthenia and those of hysteria, only an involvement of a greater number of functions, a more widespread distribution of the condition in hysteria as compared with neurasthenia.

If, however, the stability of the stigmata, their fixed character and long duration are characteristic of hysteria, then we have all the more reason for assuming that they are dependent upon organic changes in the ganglionic cell similar in nature to those observed in animals after fatigue experiments.

And now I would like to enter upon the last point of this paper, namely, the production of hysterical stigmata by organic brain diseases.

It is needless for me to say that hysteria may enter into and mask the features of nearly all known diseases. It is especially apt, however, to associate itself with diseases which produce general exhaustion, or which are associated with the production of toxins, or which follow metallic or other chemical poisoning. I cannot digress, however, on account of the scope of this paper.

The organic diseases of the brain with which hysteria is usually found associated are those which produce general disturbances of circulation, increased intracranial pressure or general concussion.

The disease *par excellence* with which hysteria associates itself

is multiple sclerosis. I have prepared for publication in another paper an exquisite case of this character, in which the hysterical element was so pronounced that notwithstanding the presence of nearly all the classical signs of multiple sclerosis, a mistake of diagnosis was made and the patient subjected to a course of treatment little short of cruel.

Hysteria is especially apt to be associated with brain tumor, and very often in the early stage of tumors located in latent brain areas it is not uncommon to make false diagnosis of hysteria. In cases of fracture of the base of the skull it occurs at times that we have hysterical stigmata superimposed upon the symptoms and signs due to organic brain lesions.

It is apparent, therefore, that hysteria associates itself with those conditions which alter the central nervous system, either by way of general exhaustion or intoxication or in which there is a general disturbance of the gray matter produced by inflammatory or circulatory changes. It is easy to picture to ourselves that multiple sclerosis, brain tumor, cerebro-spinal syphilitic meningitis, traumatic concussion, produce minute changes in distant cortical or sub-cortical centers, either by way of general pressure or circulatory disturbances. Pressure or disturbance of circulation produce a malnutrition of the ganglionic cell, which must resemble very closely the condition of the cells found in exhaustion by Guerrini, Hodge and others. That these changes in cells give rise to passing conditions of paralysis, anesthesia, etc., even under ordinary non-hysterical conditions we see daily in the transient signs and symptoms accompanying ordinary cases of organic hemiplegia. I need but call your attention in this direction to analogous fleeting conditions of hemiplegia, anesthesia, amaurosis, aphasia, which often appear in the uremic state of Bright's disease, and are commonly attributed to either localized edema or toxic conditions of the cortex, and which disappear almost as quickly and as spontaneously as similar hysterical conditions.

I assume, therefore, that hysterical signs and symptoms which we see accompanying organic diseases of the brain are the result of organic changes in the ganglionic cells, and that these organic cell changes result in a disturbance of their functions which lead clinically to that condition which we know as hysteria.

The principal end of these theoretical considerations is that

hysteria should be treated, not as a pariah of diseases, but should have our careful attention, just as neurasthenia has. That while suggestion is useful, it is not curative.

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A CASE OF CRURAL MONOPLÉGIA PROBABLY REPRESENT-
ING THE EARLY STAGE OF A UNILATERAL ASCEND-
ING PARALYSIS DUE TO DEGENERATION OF
THE PYRAMIDAL TRACTS.

BY CHAS. K. MILLS, M.D.,
OF PHILADELPHIA, PA.

Four or five years ago I presented the records of two cases which seemed to me to constitute a new clinical type. One of these was a man in whose case a paralysis began in the right lower extremity and extended later to the upper and finally to the face. The other was a woman I had seen many years before, in whom the same order of events took place, paralysis beginning in the left leg and extending later to the left arm. I saw this patient several years afterwards and the paralysis had then gone to the other side. Dr. Spiller reported a similar case as did also Dr. Potts. Later Dr. Spiller and I presented a case with post-mortem findings which showed that the disease was due to progressive degeneration of the pyramidal tracts. Dr. Patrick also reported a case.

Recently in the suburbs of the city I saw a case which seems to belong to the same type, although it is at present one of crural monoplegia. Mrs. W., 50 years old, was seen in consultation in October, 1905. The patient, in August, 1904, first discovered some weakness of the right lower extremity, although it may have been present in mild degree before. The weakness and awkwardness in using the limb very gradually increased until about one or two months before coming under observation, since which time the physician in attendance says that the impairment has increased more rapidly. She had suffered no pain in the extremity, in the back or in the head, and had no symptoms of cerebral disease. She had occasional headaches which seemed to be of the migraine type, and now and then had slight vertigo, but this was probably due to either the condition of her stomach, or to some arteriosclerosis.

Examination showed that the patient had a rather wiry pulse. She was a stout woman with no detectable nervous affection except in the right lower extremity and possibly a very slight weakness in the upper; so slight as to be somewhat doubtful.

Examination of the right lower extremity showed general paresis of moderate degree in the entire limb, that is, all movements were impaired in force without definite localized palsy of any group of muscles. The movements of flexion, extension, abduction and adduction of the foot and also intermediate movements were distinctly impaired as compared with those of the left foot, but the reduction in power extended to the entire limb, although it appeared to be more marked distally. The right knee jerk was greatly exaggerated and patellar clonus could be elicited. Persistent ankle clonus was present on the right and also a decided Babinski response. Front tap was present and marked on the same side and the muscle jerks were also plus on this side. On the left the knee jerk was somewhat above the usual norm, as were also the muscle jerks, but patellar clonus and front tap were absent. The plantar response was irregular, the toes sometimes remaining still. At other times they went up in connection with the tarsal response, but not with a typical Babinski movement.

Careful examination was made for sensory disorders with absolutely negative results, cutaneous anesthesia in all its forms, muscular anesthesia and astereognosis being absent.

The case appeared to be an apparently motor affection best explained by degeneration of that portion of the pyramidal tract which passes from the motor cortex to the lumbo-sacral cord.

It is altogether probable that the disease in this case will eventually advance and involve the upper extremity of the same side, and also the unaffected lower extremity. Examination seemed to show some slight impairment of the upper extremity, but so slight that it was hardly fair to record it as present.

SEPARATE SENSORY CENTERS IN THE PARIETAL LOBE FOR THE LIMBS.¹

BY WILLIAM G. SPILLER, M.D.,

PROFESSOR OF NEUROPATHOLOGY AND ASSOCIATE PROFESSOR OF NEUROLOGY
IN THE UNIVERSITY OF PENNSYLVANIA.

Friedrich Müller has recently made a careful study of the disturbances of sensation resulting from lesions of the brain. He mentions that cerebral hemianesthesia without motor paralysis is seldom seen, if hysterical hemianesthesia be excluded, and that many authors deny the possibility of such an occurrence. Dejerine, among others, has said that cerebral hemianesthesia is always associated with hemiplegia, and that the most intense sensory alterations are found in the weaker limb, although no parallelism exists between the degree of the hemiplegia and that of the hemianesthesia.

Munk, Tripiér, Dejerine, Henschen and others hold that the motor cortical areas are also sensory, and Dejerine says he has never seen a lesion in the region of the supramarginal gyrus which caused sensory disturbances without motor disturbances. One must acknowledge, according to Müller, that cortical sensory disturbances seldom occur without weakness of the limbs in which sensation is disturbed.

Von Monakow has accepted the view that the motor area is confined to the precentral convolution, and that the sensory region is in the postcentral convolution and parietal lobe; and he refers in support of this view to cases of cortical hemiplegia without hemianesthesia and to cases of cortical hemianesthesia without hemiplegia. The experience of surgeons seems to show that the precentral convolution is not an essential part of the sensory area, although it cannot be denied that a lesion of this convolution may occasionally cause disturbance

¹Read before the Philadelphia Neurological Society, Dec. 19, 1905. From the Department of Neurology and the Laboratory of Neuropathology of the University of Pennsylvania, and from the Polyclinic Hospital.

of stereognosis. Von Monakow holds, from a study of secondary degeneration, that the pyramidal tract arises only in the precentral convolution.

This is the presentation of the subject as given by Müller, and to the cases of hemianesthesia without hemiplegia from lesions of the parietal lobe mentioned by v. Monakow, (cases of Cox, Mills, Redlich, Spiller, Oppenheim, Durante, v. Monakow), Müller adds the cases of Prevost, Wilbrand, Lang, Henschen (4), Jany, Long, and five cases of his own. He shows that subjective disturbances of sensation (paresthesia) may be more extensive than objective sensory disturbances from a cortical lesion.²

Among American writers the one who has longest and most persistently maintained the separation of the motor and sensory areas of the brain is C. K. Mills. At the meeting of the American Neurological Association in St. Louis in Sept. 1904, he suggested that the cortical sensory area for the upper limb is probably separate from that for the lower limb. This view has been entertained by others also, thus Alfred W. Campbell³ says: "I incline to the belief that the area for common sensation, like the motor area, will ultimately be divided into different levels or centers." Doubtless many others have held a similar opinion, but there has been little real foundation for it. In the same paper Campbell remarks: "Proof, from the pathological side, of the correctness of this localisation [of the motor area anterior to the central fissure] has been supplied by an examination of the brains of cases of amyotrophic lateral sclerosis. Amyotrophic lateral sclerosis is a perfect example of a malady limited in its affection to the muscles and the motor system of neurones; and on making serial sections of the central gyri in two typical instances, it was extremely instructive to find profound changes confined absolutely to our 'precentral or motor area' and consisting essentially of a destruction of the cells of Betz."

The idea of employing cases of amyotrophic lateral sclero-

² Friedrich Müller, *Sammlung Klinischer Vorträge*, Innere Medizin, No. 118-19, 1905.

³ Campbell. *The Journal of Mental Science*, Jan. 1904, p. 651.

sis to limit the motor area, was suggested by me⁴ in 1900, and in my report of a case of this disease studied with this object of localization in view by the Marchi method, mention is made of degenerated fibers in the postcentral convolution. They were fewer by far than were the degenerated fibers in the precentral convolution, but they were unquestionably present. I have recently re-examined these sections. It is true that the relative intensity of the degeneration in the postcentral and precentral convolutions, as represented by the artist in the diagrammatic drawing accompanying my paper, is not correct. The difference in the results reached by Campbell and by me may depend on the fact that he relied on alteration of the cells of Betz, and I on degeneration of nerve fibers as shown by the Marchi method.

I have had recently an opportunity to study a case which shows that sensation may be affected from a cerebral cortical lesion, without motor paralysis; but still more important, that the sensory alteration may be confined to one limb. From this we may conclude that the sensory centers for the limbs are distinct from one another.

M. W., male, 38 years of age, teacher, came to my clinic at the Polyclinic Hospital, in Aug. or Sept., 1905.

He was perfectly well until July 21, 1904. He was struck on that day over the right parietal lobe with a club by a man who intended to injure him. He was unconscious one or two hours and was confined to his bed about ten days after he received the blow. He was unable to move the fingers of his left hand during the two weeks following the injury and could not make a fist. It is impossible to say whether this inability was the result of motor weakness or of sensory disturbances. He could move his lower limb the day following the injury. He is uncertain as to whether the lower part of his face was paretic or not. The hand at first felt "dead," and he has had paresthesia in it since the injury. He has never had any subjective or objective disturbances of sensation in the left lower limb or face.

Present condition, Dec. 11, 1905: The movements of the

⁴ Spiller. *THE JOURNAL OF NERVOUS AND MENTAL DISEASE*, 1900, p. 165, and *Contributions from the Wm. Pepper Laboratory of Clinical Medicine*, vol. 1, 1900.

left upper limb are awkward, although the limb can be moved freely at all parts, and is not weak. He is unable to button his coat with his left hand alone when his eyes are closed, because of incoordination of the fingers, but can button it promptly with his right hand. The sense of position is greatly impaired in the fingers of his left hand, and he is usually unable to tell which finger is moved, or when a finger is bent backward or forward. Stereognostic perception is also greatly impaired in his left hand, and usually he is unable to name any object placed in this hand if he does not see it. Occasionally if the object falls from the hand he is unaware of the loss. Sensations of touch, pain and temperature are diminished in the left hand, but not to the same degree as are the sense of position and stereognostic perception. He will occasionally answer correctly when his left hand is touched or pricked with a pin, but usually his answers are uncertain and in marked contrast to the positiveness with which he replies to sensory tests of the right hand. The sensation of touch is a little less acute in the left hand than in the left arm above the elbow. Pain sensation is less altered than tactile sensation, and temperature sensations for both cold and warmth are more nearly equal in the two upper extremities. The spacing sensation is also greatly altered in the left hand, and he cannot tell whether the thumb and first finger are near together or far apart. In the right hand he can tell whether the thumb and first finger are one or two inches apart. Sensations on the chest seem to be the same on the two sides.

The left lower limb is not affected. His answers to sensory stimuli are always correct and prompt. He recognizes at once any movement of the toes and the direction in which they are moved. The limb is not weak. The patellar reflexes are not prompt. Sensation in the left side of the face appears to be entirely normal, and the right side of the body is not affected. Hemianopsia is not present.

Extremely interesting in this case are the marked sensory alterations of the left upper limb, with no disturbances of the left side of the face and of the left lower limb, and no motor palsy of the left limbs, at least at the present time; the symptoms resulting from a blow given over the right parietal lobe. The case seems to indicate that the sensory center for the upper

limb must be distinct from those for the face and lower limb. I am inclined to place the lesion in the lower part of the parietal lobe, in part because this area is near the motor center for the upper limb, and in part because of a case I⁵ reported in 1898. This was as follows: A man complained, during the night preceding his attack, of fatigue, headache and inability to sleep. The following morning he fell to the floor on attempting to arise from his bed, but was not unconscious. When he was found he had paresis of the left limbs and of the left side of the face and tongue. Later the patient could raise his left upper limb above his head, but every movement of this limb was ataxic in an extreme degree, though the limb was not paralyzed. The mental condition of the patient prevented an examination of the condition of sensation. At the necropsy a hemorrhage was found in the right parietal lobe. The hemorrhagic area was about 2 centimetres in diameter, and extended inward in the form of a cone to the lateral ventricle, having its base in the cortex. It was situated about 4 centimetres from the longitudinal fissure, and about 2 centimetres or 3 centimetres behind the Rolandic fissure. The injury was in, or very close to, the supramarginal gyrus. The ataxia was probably caused by a loss of the sense of position.

The case that I now report seems to indicate that the alterations of the sensations of position and space and of the stereognostic perception is greater from a lesion of the parietal lobe than is the alteration of the sensations of touch, pain and temperature.

In a paper published in 1904 I⁶ discussed the location of certain forms of sensation in the parietal lobe, and reported two cases with necropsy. In one of these the loss of stereognostic perception and of the sense of position in the left hand, the awkward movements of the left fingers, and the impairment of sensation for touch, but not pain, in the left upper limb were attributable to tuberculous plaques almost confined to the right parietal lobe. I could find no case of this tuberculous meningitis in plaques described in American literature, and few in foreign. The other case was one in which ataxia, paresis and astereognosis of the left upper limb were caused by softening of the right parietal lobe.

⁵ Spiller. *JOURNAL OF NERVOUS AND MENTAL DISEASE*, Jan., 1899, p. 43.

⁶ Spiller. "A Report of Five Cases of Tumor of the Brain with Necropsy." *The American Journal of the Medical Sciences*, Feb., 1904, p. 311.

Society Proceedings

PHILADELPHIA NEUROLOGICAL SOCIETY

October 24, 1905.

The President, DR. JOSEPH SAILER, in the Chair.

Atrophy of One Lower Limb, following Specific Urethritis.—This case was exhibited by Dr. J. W. McConnell.

Testing the Iris Reaction to Light.—Dr. Pickett said that in testing the light reaction it is customary to have the patient look into infinite distance, that is, at some object about 200 feet away, while the examiner covers one eye with the hand or with a piece of card-board and then quickly uncovers it, observing the change in the size of the pupils. Dr. J. W. McConnell, last summer, was in the habit of using a pocket electric lamp for illuminating the eye, and making the contraction of the iris more complete. This brought to Dr. Pickett's mind the use of this apparatus in a particular way. He mentioned some objections to the use of this apparatus, as of any artificial light, in the ordinary way. When the light is flashed at one side the patient thinks of that light; and if there be such a thing as Haab's "psychic reflex" a part of the contraction of the iris must be accredited to it. Certainly a fallacy of the ordinary method is that the patient tends to accommodate for some near object when his eye is uncovered, and the contraction of the pupil which occurs is partly a contraction in convergence and accommodation. The average patient is apt to look at the examiner's face or hand.

Now in this particular method having the patient fix upon the bulb of this handlamp both pupils contract, representing a combination of the reaction in accommodation and convergence with the so-called Haab's psychic reflex. The patient still fixing upon this bulb, Dr. Pickett flashes the light and a further contraction of the pupil occurs, which must be a pure light reflex. Some one may say that the pupil being already contracted in convergence, the further contraction, by flashing the light, must be only a partial reflex to light. His answer to this is that where the light reflex was doubtful by the usual method, it became very striking by this method; and while it is perhaps a residual light reflex, it is so distinct that Dr. Pickett thinks it has some advantage over the usual methods. An objection which Dr. de Schweinitz has to this method is that the moment a light is flashed in front of the patient's eyes, he squeezes the lids and what is known as the Westphal-Piltz reaction enters into the contraction observed. However, as the Westphal-Piltz reaction is a momentary phenomenon the pupil must return quickly to the size determined by the other factors named.

The case Dr. Pickett presented was one of tabes in which the light reflex by the ordinary methods was not distinct. Having him look at this bulb, however, it was seen what a strong reaction there was to light.

Dr. Dercum thought the method had a distinct value. He thought the fact of eliminating the reactions of accommodation and convergence a distinct gain. He did not think that the objection in regard to the Westphal-Piltz reaction is of much moment. He thought it might interfere with a very delicate test, but in such cases the test for the consensual light reflex would aid in settling the question. In studying doubtful cases of light reaction, he thought we should take both the

consensual and direct light reflexes. For the relative presence of light reaction, however, he thought the method of Dr. Pickett a valuable one.

Dr. Weisenburg thought the method a very valuable one. He stated that he had never seen a pupil contract in accommodation and did not believe accommodation had anything to do with it. He called attention to a new pupillary reflex. He stated that the Westphal-Piltz reaction was demonstrated a number of years ago, and consisted in contraction of the pupils by attempt to close the eyes. He stated that he had never seen this without at the same time noticing a movement of the eyeball, and it struck him that this contraction of the pupil is really an associated movement. When the eyeball moves upward, the pupil contracts. This contraction he did not believe to be a reflex at all, but an associated movement. If, while the eye is closed, the eyelid is suddenly lifted a contraction of the pupil occurs. He stated that he had examined many cases of facial palsy, and upon lifting the eyelid upon the affected side, he did not get this reaction, which would indicate that the seventh nerve forms part of the arc. He believed this to be a new reflex, and that the seventh nerve as well as the third took part in it, because it is absent in seventh nerve paralysis. To explain this, it is necessary to consider the seventh nerve as partly sensory, and Dr. Weisenburg believed it to be such, this belief having been borne out by many reported cases.

Dr. Pickett, in answer to Dr. Dercum's remarks, stated that in studies on cases of paresis at Blockley they had decided that the consensual reflex was no more delicate than the light reflex and corresponded to it. He said that the advantage which he and Dr. McConnell claim for this method is that it appears to be more delicate than the light reflex by the ordinary method.

In cases of tabes in which the light reflex was very slight by the ordinary method and the residents declared it was absent, it was strong by this method, and if there was no grave fallacy in the method, it possessed a decided advantage over the old one.

A Case of Double Ego.—This paper was read by Dr. Alfred Gordon.

Dr. Pickett said he had reported a similar case about a year ago. He believed the guiding phenomenon to be motor hallucinations, as described by Séglas, Ballet and others rather than sensory hallucinations. The motor speech center being active, there are voices speaking in the patient, and by other motor centers he is led to do things independently of his will. This long continued control of the patient by forced movements leads to the idea that he has a double personality. These belongs to a different class of cases from those of double or alternating consciousness.

Dr. Lloyd thought there were three conditions in which this curious affection of the sense of personality existed, namely hysteria, epilepsy and delusional insanity. He thought hysteria could be excluded in this case and that it was most probably an epileptic condition. He did not attach much importance to the attempts of the patient to explain his own symptoms. He thought the patient had heard too much scientific talk at clinics, and he attempts to use terms which he has heard doctors use in explaining his condition. He considered that the loss of consciousness and the long sleep afterward led to the diagnosis of epilepsy. Gowers thus explains the case of a cabman who in a state of epileptic automatism would drive through crowded streets without an accident and remember nothing about it afterwards. Dr. Lloyd thought there were some things about Dr. Gordon's case that would suggest delusional insanity, and it was possible for the two diseases, epilepsy and delusional insanity, to go together. All things considered, however, he believed that epilepsy would best explain the condition.

Dr. Riesman recalled the case of Mrs. Piper, a sort of medium,

who had a triple personality. In the beginning of her career she was controlled by a Frenchman. She did not understand French, but in her sèances would speak French fluently. She later became controlled by another personality. Sometimes one personality would express his ideas in writing, while another would speak through the mouth, and she could thus answer two sets of questions at once. While not a case of epilepsy or insanity, this case was brought to his mind by Dr. Gordon's paper.

In closing the discussion of this paper, Dr. Gordon stated that his reason for calling this a case of double ego were as follows: Cases have been reported of double personality, but none of them resemble this: here is a man who is perfectly conscious of what is going on about him and he is convinced that he like any other individual is divided into two. Dr. Gordon did not believe, therefore, that this could be called a case of double personality. He did not believe the case could be one of paranoia. He stated that he had looked up the literature for a period of seven years and had not found a case like it. The fundamental difference between his case and those recorded is in the fact that in the recorded cases the patients passed through the different states alternately, while in this case the two egos coexisted at the same time. In regard to the diagnosis, he believed that the case was probably a post-epileptic psychosis.

A Case of Crural Monoplegia probably Representing the Early Stage of a Unilateral Ascending Paralysis due to Degeneration of the Pyramidal Tracts. This case was reported by Dr. C. K. Mills.

Dr. Chas. K. Mills exhibited a brain showing arteriosclerosis and two areas of necrosis, one cortical precentral and the other in the pons near or involving the dorsal longitudinal bundle. The main feature of the symptomatology were Jacksonian epilepsy and paralysis of associated movements. The case will be later reported at length.

Dr. McConnell said in summing up the case, the cortical lesion only became active because of the attack of uremia, this part of the cortex being the place of least resistance.

CHICAGO NEUROLOGICAL SOCIETY.

October 26th, 1905.

The President, DR. HAROLD N. MOYER, in the Chair.

A Case of Broken-Séguard Paralysis.—This was presented by Dr. Julius Grinker.

J. S., an Austrian laborer, aged 24, entered Cook County Hospital, September 14, 1905.

About five months ago, during a quarrel in which knives were used, he sustained a stab wound in the middle of his back and several large and small flesh wounds upon the posterior portion of the right thigh, almost immediately thereafter a complete paralysis of motion appeared in the right lower extremity, which compelled him to remain in bed three months. Improvement was slow, but he gradually began to use his limb, so that now he is able to walk without a cane. Almost from the beginning he complained of pains in his right thigh and leg, which still persist, although in a mild form. The entire left lower extremity feels cold since the accident, and sensation in this limb is either perverted or entirely abolished. At no time have the sphincters been involved.

Dr. Grinker said that upon examination the patient was well nour-

ished, of average weight and height and presented several scars, evidently the remains of injuries sustained five months ago. One of these, larger than the rest, about 3x5 inches, was seen on the outer portion of the right buttock; the others were scattered over the upper portion of the right thigh. A medium sized scar was found in the right side near the median line between the seventh and eighth dorsal spines. He points to this spot as the exact location where the knife penetrated the spinal cord. The viscera were found normal in every respect; glandular enlargements could not be detected. No anomalies of sensation or motion were discoverable in the face and neck. The palpebral fissures were equal on both sides; also the pupils, which reacted promptly to light and to accommodation. There was no wasting or paralysis of any of the muscles of the upper extremities, trunk or abdomen.

The left lower extremity appeared to be of normal volume and strength.

The right thigh and leg show considerable atrophy, but this seemed to affect the limb uniformly. Strength was considerably reduced and spasticity was marked.

Of the superficial reflexes, the abdominal could not be obtained on either side, while the cremaster was active on the left and slightly reduced on the right side. Of the deep reflexes, on the left side the knee jerk and Achilles phenomenon could not be elicited, even with reinforcement, but on the right side the knee jerk and Achilles jerk were exaggerated, ankle clonus was present and typical Babinski, Oppenheim and Gordon signs were in evidence. In testing the lower extremities for incoordination, the left was found normal, but the right limb was distinctly ataxic and presented various degrees of muscle and joint sense disturbance.

The entire right lower extremity showed marked hyperesthesia beginning at the groin; from the end of the right costal arch to the beginning of the right Poupart ligament there was complete anesthesia enveloping the entire right half of the body; the left lower extremity and left trunk were perfectly normal to touch.

On the right side, a slight pin prick was instantly perceived as an intense pain in the entire lower extremity up to the inguinal fold, extending all round the limb. A strip of analgesia 2 1-2 to 3 inches in width, extending half round the trunk, was superimposed upon this hyperalgesic area.

On the left side, there was complete analgesia on the anterior surface of the left lower extremity up to the inguinal fold. The external and posterior surfaces were only hypalgesic.

The right side was sensitive to cold and heat. The entire left lower extremity showed almost complete thermanesthesia, beginning at the highest part of Poupart's ligament and extending almost circularly around the left half of the body.

An examination made October 24th revealed practically no change in the findings, except that the left knee jerk, previously absent, had returned.

The case presented a motor paralysis of the right lower extremity and a sensory paralysis of the opposite limb.

The right sided motor paralysis was principally an upper neurone palsy with spasticity, exaggerated reflexes, ankle clonus, Babinski, Oppenheim and Gordon signs; of sensory disturbance on this side there was loss of muscle sense and impairment of tactile sensation.

The left side presented sensory paralysis of the pain and temperature senses, with preservation of the tactile and muscle sensations.

A strip of analgesia on the right half of the trunk, including the area supplied by the ninth and tenth dorsal segments of the cord, indicated approximately the situation of the lesion in the cord. According to our tables of localization, the ninth and part of the tenth dorsal segments are found between the seventh and eighth dorsal spines. It will be recalled

that the patient received a stab wound in the cord exactly in the before mentioned situation, which proves the case to be a traumatic Brown-Séquard paralysis with almost all the typical signs of that syndrome. The case is almost a laboratory experiment, proving the decussation in the cord of the sensory fibers for pain and temperature.

A Case of Serous Meningitis.—This was presented by Dr. Henry Gradle with the tentative diagnosis. The history is that of a patient coming from a family that is fairly healthy, no serious sickness in childhood, except repeated attacks of chorea. At the age of 15, in October, 1900, had a febrile attack, stupor, convulsions, retracted head, headache; stupor leaving gradually. He was sick from the middle of October until late in December, when all sight had disappeared. He was presumably treated with iodide of potassium, and, as he claims, without improvement.

He came to Dr. Gradle in 1902, two years after his first attack. The general health was, on the whole, good. He was strong, could get about well, never sick except an occasional slight attack of tonsillitis, but had a numb feeling in the head, tension in the nerves, as he expressed it, "a something in the middle of the head," but no pronounced mental involvement. He presented atrophy of both optic nerves—uncertain whether post-neuritic or not—and it looked more like pressure atrophy. Vision was better than 1-10 in each eye, the field was contracted to about half, and in each meridian concentrically contracted. Under iodide of potassium and strychnin in large doses he improved unquestionably. His vision was reduced to 20-60 in one and 20-80 in the other eye. The field has never contracted, but increased a trifle. The vision remained the same for about two years, and then began to fail a little. He was given a thorough strychnin treatment subcutaneously, according to Gowers, with doubtful improvement. The question occurred whether there was suppuration. At first examination he gave no history of a nasal disease, but on iodide of potassium in large quantities he got profuse nasal suppuration. There was no sinus disease, no headache, no indication for operation, and without operative interference one cannot locate the sphenoid in a fairly narrow nose. There was no trace of pus under douching, and there were periods when none could be found, but every time he used iodide freely he had free suppuration on both sides of the nose.

The objective examination has never given any decided result. In August of the present year an attack occurred similar to the first one, but not so severe. He was disinclined to get up, staggering, dizzy, with pain in head and back, and had great irritability. There has been some little rise of temperature, $100\frac{1}{2}$, $99\frac{1}{2}$ or a little over, but occasionally a normal condition. He has improved pretty steadily since the latter part of August.

Dr. Patrick asked if the pressure symptoms had changed.

Dr Gradle said that there had never been any neuritis visible; never any vascular change in the eye. The atrophy was more pronounced this year than previously, and while the vision sank a trifle early this year and even now was less than in the spring it was still about 1-10 in either eye. The nerves are paler than they were. He is not entirely over his attack; a day or two ago he had a temperature of about 100; he is still depressed, but brighter mentally than he was. He can enjoy talking and being read to and can walk fairly well. His condition is one of increased intracranial pressure, probably never totally absent in these past years and pronounced during the present attack, and accompanied by low fever. On the whole, it seems these symptoms fit best into Quincke's description of serous meningitis. Quite a number of cases have ended in recovery, and the anatomical diagnosis is not difficult. The largest portion of the material is probably furnished by the otologists who see frequently a condition which is the result of increased intracranial pressure, and sometimes with pronounced symptoms like paresis, paralysis and sensory dis-

turbances, etc., and where there is no other lesion, recovery is the rule after the suppurating focus in the mastoid bone is removed. Where done *in vivo*, there is always a large escape of suppurative matter. There is sometimes evidence of epidural abscess and brain abscess which is complicated by a serous meningitis, but in the individual case the diagnosis is indefinite. It has varied between serous meningitis and brain tumor. Here the long interval of comparative immunity almost excludes the possibility of tumor.

Dr. Sanger Brown asked whether it would not be well to make a lumbar puncture in a suspicious case like that?

Dr. Gradle replied that the symptoms were not so serious as to warrant undertaking this step, which he was not sure was free from danger.

Dr. Patrick said that it would be dangerous to do a lumbar puncture in such a case; particularly where there was increased intracranial pressure, for in all probability the medulla is pushed down further than it should come, and relieving the tension from below would allow it to be pushed still further down. He agreed with the caution of Cushing, that in such cases where justifiable to puncture to take off the pressure, an exceedingly small amount of fluid should be allowed to escape. To puncture and allow the free escape of fluid is decidedly dangerous.

Dr. Hecht said that in Berlin they had discarded puncture entirely. It had fallen into disrepute in diagnosis work because of the lymphocytosis, as well as the albuminosis. He asked whether there was any history of acute infection, such as influenza or grippe?

Dr. Gradle replied in the negative and said the attack was supposed to be typhoid, but the history spoke against it. The stupor came on quickly, almost suddenly.

Dr. Grinker said that, through the kindness of Gr. Gradle, he had examined this case very carefully and had tried to find some positive diagnosis. The diagnosis of serous meningitis is always made by exclusion. They had been unable to find in the history or examination anything which would indicate this to be an organic nervous lesion, such as multiple sclerosis or brain tumor. While in Vienna he observed two cases in which such a diagnosis had been made, and actually saw in one case the acute attack, whereas here only a history of such attack is given. The attack was somewhat of a stupor with slight retraction of the head, headache and a very slight elevation of temperature, 99.5-100. In the absence of any other symptoms the diagnosis of serous meningitis was made; the patient made a complete recovery in six or seven weeks. He did not watch the other case and consequently did not know whether there was a recurrence of the symptoms. Quincke divides these into the acute and the chronic, and those which are paroxysmal. There is a period of slight illness, the patient almost recovers, or entirely so, until a few months or years later a similar series of symptoms develops. He ascribes this to an accumulation of serum, which in the course of time is being absorbed, and with the absorption of the fluid the symptoms vanish; as the serum accumulates again there is a recurrence of the symptoms, which may be so illy defined that one would not know what to call them, but all suggest meningitis. He fully agreed with Dr. Gradle that by exclusion this was a case of serous meningitis.

Dr. Gradle said he had made a tuberculin test. There was no indication of tuberculosis. He had never examined the pus microscopically. The suppuration was intermittent. The iodide causes a free, watery discharge, but this may be changed to suppuration.

Dr. D. O. Hecht read extracts from a paper on dementia præcox.

Dr. Patrick said that he would like to allude to two forms of what seemed to him should be classified as dementia præcox; first, the simple dementia præcox, which he thought should properly be so called, and have included in it a dementia grafted upon an individual who has never been entirely normal mentally, that is, a somewhat behind-hand individual; the high

grade imbecile, not quite up to normal in a mental way, who goes on gradually developing and improving, acquiring greater intellectual capacity, but never developing up to the normal, until at sometime in his career he begins rapidly to fail and show the ordinary symptoms of dementia præcox. Dr. Patrick had seen a few such cases and had not known any way to classify them except to assume them as showing ordinary dementia præcox occurring in defective individuals. So far as he knew—and his knowledge of the literature was meagre—this particular kind had not been much written about. Still he thought it should be recognized and the cases differentiated from the various vagaries and outbreaks likely to occur in defective individuals. The simpler form was oftener seen in private practice than in public. He thought practitioners saw such young people who were giving annoyance to their parents and friends, but were not bad enough to be sent to an asylum, and that these cases were not so very rare. He had seen a good many, and had seen them also where the simple dementia occurred pretty well along in life.

Dr. Sanger Brown said that he had been a long time trying to find out just what dementia præcox was, and when Dr. Hecht stated it was the purpose of his paper to inform them what it was, and then said that his paper was so long that he could not read that part of it, Dr. Brown was disappointed: Dr. Hecht went on to the prognosis. From what he could gather from the literature and the discussions on the subject, he thought that Kraepelin, who set this discussion going, was a very enthusiastic student and carried away somewhat in his enthusiasm, and had been so intent on carrying out and following out this idea, which he had done cleverly, that he had led them astray. He does not claim to have discovered a new disease and never meant to claim he had, but many of his readers and people who study his writings have some way been under the impression that he was making such claim. Dr. Brown said he did not believe that Kraepelin discovered dementia præcox any more than Marie discovered hereditary cerebellar ataxia. He took out some well known symptoms and gave them a name. Dr. Brown thought the discussion provoked had done good, but when this had been reviewed by practical alienists, men who spend their lives in close contact with the insane in various phases and follow the cases through, who in the wards of institutions of their own have had years of study and have been able to make their own conclusions and prognostications, Kraepelin's dictum had not been endorsed.

Dr. L. Harrison Mettler said we are all familiar with the enormous amount of discussion which dementia præcox, like paranoia, has provoked and with the different views that are oftentimes diametrically opposed. This very discussion of the subject indicates the weakness in much of our modern psychiatry, and Kraepelin has even more forcibly indicated the weakness in adopting a classification based largely upon the course and prognosis of the respective diseases. Dr. Mettler believed the method is an erroneous one and in following it we are traveling along a wrong road. He did not deny the popularity of the method. It is in line with all the earlier and more primitive methods of studying disease, wherein the symptomatology alone is taken as the essence of the disease, and no attempt made to correlate the mere symptoms with a pathological basis as the only and true essence of the disease. It is the clinical method, popular because so obvious in its presentations but with all its instability and inadequacy when contrasted with the pathological method. In spite of the fact that clinically we started upon the diagnosis of a disease by a close observation of its symptoms, course and termination, the disease itself which we are diagnosing is not the symptomatology but the histopathological changes upon which that symptomatology depends. The distinction is not an important one and indicates the reason for the opposition of Wernicke to Kraepelin.

Leaning upon normal psychology and upon cerebral physiology and localization, Wernicke has attempted an explanation of psychiatry upon a

known cerebral basis. Physiological and pathological psychology are brought into line with our knowledge of brain functions. In spite of the fact that much is still unknown in regard to the cerebral functions, and in spite of the fact that we might not agree with Wernicke in some things, as for example his correlation of all psychic activity with the speech function, Dr. Mettler was convinced that his method is the only truly scientific one. It is the one in which our best efforts should be employed in the attempt to solve the problems of psychiatry. We should study closely normal psychology and correlate the observations made with the physiological functions and changes of the brain. With this basis to work from, we should study abnormal psychology or insanity and correlate its observations with abnormal cerebral physiology or cerebral pathology. By the Kraepelin method, we are studying the psychoses rather from their end-products: by the Wernicke method we are studying them from their very essence. The wherefore of a certain set of psychic manifestations is clearly more important to know than the course and mode of termination of those manifestations. In the method which he has adopted, Kraepelin has accomplished much more perhaps than any of his predecessors. The instability of the method, however, will practically guarantee always an interminable discussion of whatever is founded upon it. In the physiopathological method which Wernicke has adopted, though at the present moment the relative paucity of positive data is glaring enough, the method itself, based as it is upon a study of the essential nature of the disease itself, will gradually lead to a diminution instead of an augmentation of psychiatric discussion.

Dr. Sidney Kuh said one point may be worthy of mention in discussion of the differential diagnosis of dementia præcox from the circular forms of insanity—the depressed condition. He thought the depression in dementia præcox is decidedly different from that in the maniacal stage of circular psychosis. They are atypical cases. He should, in any case of mental depression occurring in a young individual in which the symptoms were not typically those of the maniacal form, feel that it was a case of dementia præcox. As for Dr. Mettler's suggestion as to a sounder basis for classification, we shall not be able to have what he asks at the present stage and for many years to come, probably. Unfortunately physiological psychology has not given us, and will not for a long time, the necessary data which would enable us to build up a pathological psychology on that basis. Any one who has worked at all along that line must realize what an incredible amount of experiments will have to be made and how tremendous the difficulties are in the way of getting sound facts, and we certainly will never see the time when it can form the basis of classification, and Dr. Kuh doubted whether the next generation would see it.

Dr. Moyer said when he began to practice in an insane asylum, the classification was at first based upon the causation. Then we drifted into the special forms, where we had a name for every aberration—pyromania, kleptomania, and a new name was devised for every particular bent of an individual patient. Then came along the volcanic eruption of Spitzka on one hand and Gray on the other at that time, in fitting the idea to the monomanias and classifying them under paranoia. Later we added to that the hebephrenia, and now we are asked to group the hebephrenias and catatonias and all forms of early dementia into one grand group of dementia præcox. Therefore the tendency has been to first narrow the classification, then to broaden it, again to broaden and again to narrow it; two broadenings and two narrowings in an experience of about 25 years. Now in this dementia præcox to include the paranoias and the catatonias and hebephrenias is a mistake. They are well marked and valuable clinical entities, and they are useful in classification. The dementia simplex is a good thing, the one really sound addition that the

whole discussion adds to the value of our present classification. It is not new. It was recognized, but not clearly as now, because in those days we had very vague ideas about the acute primary dementia; but the present term is a good one and clearly demarked and it will stand. The great service it brings is the emphasis it lays on the element of dementia in many of these cases which we did not formerly appreciate as we do now; but to group them all under one head seems to be taking a step backward.

Dr. Hecht, in answer to Dr. Sanger Brown, assured him of his personal regret that the reading of the paper was fragmentary and desultory; but he assured him also that the points he sought to bring out with reference to Kraepelin and his doctrine are well cared for in the text that was omitted. As for the definition of dementia præcox, its scope and what Kraepelin himself was personally willing to vouch for are also mentioned. As Dr. Moyer has just set forth, when the bizarre has all been excluded, the overwhelming entity of dementia has been set forth with considerable emphasis. Dr. Kuh's point as to the differential diagnosis between dementia præcox and circular insanity was well taken, and perhaps Dr. Hecht had slighted in some degree the question of differential diagnosis, but he had to curtail a little. He had only sought to give a treatise that will cover the debatable or controversial ground, the questions that have arisen in the last few years on the subject, and correlating the known facts and presenting them as he was not able to find them in any of the American literature.

Periscope

Centralblatt für Nervenheilkunde und Psychiatrie

(Vol. 28, No. 180, Jan. 1, 1905.)

1. On Death in Functional Psychoses. REICHARDT.
2. On a Case of Hemianopsia with Disturbances of the Color Sense (red-green blindness) in the Preserved Field of Vision. ABRAHAM.

1. *Death in Functional Psychoses.*—The question of whether a patient with a so-called functional psychosis can die simply of the brain disease underlying it can rarely be answered decisively, since there are many indirect causes of death, malnutrition, exhaustion, secondary infection, etc. Reichardt believes, however, that occasionally the mode of death indicates organic brain disease as the sole cause, especially in the various cases included under delirium acutum. He gives several case histories to support this contention, excluding any in which there are evidences of visceral disease. Kraepelin, formerly as "collapse delirium," now as "infection delirium" included these cases; but neither infection nor exhaustion can be established in all cases. Bacteria found in the blood and organs of patients dying of acute delirium arise from terminal infections and account for the pre-agonistic rise of temperature. As signs of organic brain disease the author has found changes in the inner table of the skull from increased pressure; also choked disc. Reichardt has a method of comparing the cranial capacity with the brain weight. From it he infers an increase of pressure indicating a swelling of the brain as a cause of death in acute delirium. The symptoms of this pressure are inhibition of thought, dulness, stupor, somnolence, coma. Signs of motor irritation never become definite as in paresis, nor in the final stages do we find brain atrophy.

2. *Hemianopsia.*—The writer says he cannot elucidate the case reported here, because we know so little for differentiating between color blindness from brain disease and the congenital variety. The onset in Abraham's patient was acute with prolonged deep stupor, right hemiplegia and conjugate deviation of the eyes to the left. Later interference with reading and writing were the only persistent defects except for right hemianopsia with red-green blindness in the preserved half fields. There were no changes in the fundus. It is not certain whether the patient was unconsciously color blind all his life.

(Vol. 28, No. 181, Jan. 15, 1905.)

1. Functional Mind Blindness. VAN VLEUTEN.

1. *Mind Blindness.*—The simulation of organic diseases by hysteria has led Briquet and others to speak of hysterical pseudo-meningitis, Westphal of pseudo-sclerosis, and the older observers, Charcot especially, of hysterical hemiplegia, monoplegia, paraplegia, etc. A number of writers have reported cases of hysterical aphasia and agraphia; but only one, Weir Mitchell, has mentioned mind blindness, now called optic asymbolism, as of functional origin. The writer's case is one of Korsakow's psychosis, in which there were asymbolic symptoms. There was no hemianopsia as commonly found in mind blindness of organic origin, but hysterical stigmata were present.

(Vol. 28, No. 182, Feb. 1, 1905.)

1. On Neuronal and Its Use in the Insane Asylum. WEIFENBACH.

1. *Neuronal*.—Weifenbach says that hyoscine and trional have been their principal sedatives, but they have tested the drug bromidi-ethylacetanid introduced by Kalle and Co. under the name neuronal. This is a white, crystalline substance, melting at 66° to 67°, soluble in 115 parts of water, but readily in ether, alcohol or oil. It has a bitter, burning taste. The dose as a hypnotic is one to two grams, as a sedative $\frac{1}{2}$ to $1\frac{1}{2}$ grams t. i. d. Cumulative effects do not appear, but the drug gradually loses its power when given continuously. Its narcotic effect is not superior to that of trional or veronal. The price is rather high.

(Vol. 28, No. 183, Feb. 15, 1905.)

1. On the Question of the Existence of Myosis in Reflex Pupillary Paralysis. HEDDAEUS.

2. On Encephalitis of the Optic Tract. ROSENFELD.

1. *Myosis*.—Heddaeus essays to explain myosis without recourse to the sympathetic. His idea is that a cortical convergence center governs accommodation and its attendant pupillary contractions so that no one of these functions can be active without affecting the others. The writer seems to be presenting the familiar doctrine of associated action of the internal recti and sphincter iridis which is opposed by Marina's experiments.

2. *Encephalitis*.—Rosenfeld, of the Strassburg clinic, reports a case conforming to the pseudo-tumor of Nonne, the symptoms of which are: more or less sudden onset, somnolence up to complete loss of consciousness, restlessness, confusion, as in delirium tremens, headache, vertigo, vomiting, disturbance of gait, transient focal symptoms, epileptic attacks and elevation of temperature—all of which belong to encephalitis as well as to pseudo-tumor, but there are two additional symptoms—slow pulse and choked disc—which are distinctive of pseudo-tumor. However, even choked disc was present in a case which Rosenfeld reports in full. Autopsy showed encephalitis centering in the optic nerves and tracts. Perhaps Nonne's cases of pseudo-tumor were similar to this in their pathology.

(Vol. 28, No. 184, March 1, 1905.)

1. The Motor Excitement in the Manic-depressive Mixed State. PFERSDORFF.

2. A Contribution to the Pathology of Tabes Dorsalis. SPIELMEYER.

1. *Motor Excitement*.—Pfersdorff gives notes of three cases in which there was a crossing of the maniacal and depressive symptoms characteristic of the mixed state, but he thinks the peculiar motor excitement is not well expressed by the customary terminology. He gives minute descriptions of several types of motor excitement in such cases.

2. *The Pathology of Tabes*.—Spielmeyer calls this a preliminary communication. It deals with studies of Cajal's silver impregnation of the axis cylinders. In this method the non-medullated fibers of the gray matter are stained. A control staining was done with Weigert's neuroglia stain, which showed something of the distribution and arrangement of the supporting substance in the degenerated dorsal columns. The Cajal preparations show at the termini of the posterior root fibers in the gray matter of the cord and nuclei of the medulla a disappearance of the coarser fibers and of the fine pericellular "geflechte." The most striking pictures were in longitudinal sections of Clarke's column, showing the cells deprived of their fibrillae. There were similar changes in the nucleus of Goll, but not in Burdach's. The Weigert glia-preparations showed corresponding increase of the neuroglia. Spielmeyer studied the cortex of the cerebellum also by these methods, and found chiefly a loss of the dendritic processes of the Purkinje cells with replacement by neuroglia.

He gives a minute description of these findings in the *Archiv fur Psychiatrie*.

(Vol. 28, No. 185, March 15, 1905.)

1. Delusion and Personality. LOMER.
2. On the Nature and Specificity of the Toxic Substances Contained in the Blood Serum of Epileptics. CENI.

1. *Delusion and Personality*.—A Speculative Psychological Essay.

2. *The Toxin in the Blood of Epileptics*.—From a new series of experiments Ceni draws the following conclusions: "The serum of epileptics injected into other epileptics in the dose of 10 c.c. produces no acute phenomena. In severe cases, especially in the "status," the blood serum is decidedly hypertoxic, producing headache, confusion, fever and an aggravation of the epileptic symptoms. The grade of toxicity is not proportionate to the severity of the case. A patient's own hypertoxic serum injected into himself between attacks poisons him, but in an attack has no effect. The hypertoxicity anticipates by some days an attack. In healthy men and animals the epileptic serum is comparatively inert.

(Vol. 28, No. 186, April 1, 1905.)

1. On the Conception and Significance of Aphasic Disturbances in Epileptics. HEILBRONNER.

1. *Aphasic Disturbances in Epileptics*.—This is the report of a case in which speech disturbance was occasional, appearing the first time in connection with a psychosis; later independently of other mental disturbance, but always after the epileptic attacks. It is of the amnesic variety, which may point to definite sensory areas as the source of epilepsy in these cases.

PICKETT (Philadelphia).

Revista di Patologia Nervosa e Mentale.

(February, 1905.)

1. The Westphal-Strümpell Disease. REBIZZI.
2. Laminectomy of the Third and Fourth Lumbar Vertebrae for a Lesion of the Cauda Equina. ALESSANDRI.

1. *The Westphal-Strümpell Disease*.—Continued.

2. *Laminectomy for Lesion of Cauda Equina*.—The patient, male, age 36, with marked tubercular history. When first came under observation was suffering with anesthesia, with which was associated a great deal of pain. A diagnosis of disease of the cauda equina was made and laminectomy done on the 17th of April. Adhesions and effusion were found. The patient was discharged from the hospital the first of August much improved. The pain had disappeared, though much anesthesia and impaired motion remained.

(March, 1905.)

1. The Westphal-Strümpell Disease, Westphal Type, Pseudo-sclerosis and Strümpell Type, Diffuse Sclerosis. REBIZZI.

1. The Westphal-Strümpell Disease, Westphal Type, Pseudo-sclerosis and Strümpell Type, Diffuse Sclerosis. REBIZZI.

1. *The Westphal-Strümpell Disease (concluded)*.—The author believes that pseudo-sclerosis and diffuse sclerosis are one and the same disease and proposes the name Westphal-Strümpell disease for it, referring to pseudo-sclerosis as the Westphal type and diffuse sclerosis as the Strümpell type. The clinical analogies of the two types are well shown in the following table:

DIFFUSE SCLEROSIS.	PSEUDO-SCLEROSIS.
Very rarely hereditary antecedents.	Neuroses and psychoses in the antecedents.
In the personal antecedents is noted the presence of trauma, intoxications, acute infectious diseases, syphilis.	In the personal antecedents intoxications, acute infectious diseases, syphilis.

Sexual indifference.

Beginning in infants as well as in adults.

Mean duration of the disease from 1 to 10 years.

Only light remissions observed; progressive course.

Grave state of prognosive dementia with motor agitation, accesses of furor, spasmodic laughing and crying, hallucinations, occasional euphoria, delirious ideas.

Vomiting, vertigo, syncope, epileptiform and apoplectiform attacks.

Marked disturbance of speech, ending in incomprehensible language, very rarely scanning of the words, often aphasia.

Expressions slow and rigid.

Frequently paralysis in the field of the facial, always unilateral, localization variable in the different branches, often transitory. Paralysis of the hypoglossal often transitory and of the motor branch of the trigeminus.

Disturbance of deglutition very frequent.

Nystagmus, paralysis of the ocular muscles, sometimes transitory, pupillary asymmetry, tardy reaction, rigidity.

Ophthalmoscopic examination always shows lesion of the papilla.

Diminution of hearing.

Slowness of all the muscular movements.

Paralysis and spastic paresis with contracture; sometimes transitory. Often hemiplegia of one side and hemiparesis of the other.

Increased tendon reflexes, rarely absence; ankle clonus, Babinski sign.

General increase of the muscular tone. Rigidity.

Tremor and ataxia in voluntary acts a little less frequent than in pseudo-sclerosis, but more frequently than in it; tremor during repose; frequently clonic contractions. Diffusion of the tremor variable; sometimes in the head and tongue.

General weakness. Walking uncertain or impossible, due to paralysis, spasms, tremors.

Sexual indifference.

Beginning in infants as well as in adults.

Mean duration of the disease from 1 to 10 years.

Remissions in the course of the disease, progressive course.

In the initial period slight mental deterioration, apathy, followed by accesses of furor, spasmodic laughing and crying, resulting in dementia, occasionally somewhat accentuated.

Vertigo, syncope, epileptiform and apoplectiform attacks, rarely vomiting.

Disturbance of speech, scanning and slow speech, disturbances similar to those of bulbar affections, the language finally becoming incomprehensible.

Expressions slow and rigid.

Trifling paralysis of the hypoglossal and of the motor branch of the trigeminus, rarely a disturbance of deglutition.

Nystagmus rare. Once a trifling pupillary asymmetry.

Ophthalmoscopic examination negative. Once amblyopia.

No recorded disturbances of the other organs of special sense.

Slowness of all the muscular movements.

Paralysis and spastic paresis with contracture of variable location, transitory then lasting.

Increased tendon reflexes, ankle clonus.

General increase of the muscular tone. Rigidity.

Tremor usually intention and ataxia of the upper extremities, sometimes with diffusion also to the inferior. Sometimes also tremor in repose. No clonic contractions. Tremor sometimes in the head or the face and in the tongue.

General weakness. Walking uncertain or paretic-spastic.

Often diminution of cutaneous reflexes.	No alterations of the cutaneous reflexes described.
Vasomotor and trophic disturbances. Sometimes muscular atrophy.	Neither vasomotor or trophic disturbances frequent.
Frequent eruptions of acne and comedones.	Frequent eruptions of acne and comedones.
Pain, paresthesia. Objective disturbances of sensibility much more frequent than in pseudo-sclerosis, namely, hypoaesthesia; hypalgesia often more marked on one side.	Pain, paresthesia. Generalized hypoaesthesia.
Disturbances of the rectum and bladder.	Disturbances of the rectum and bladder not frequent.
Bed sores.	Bed sores infrequent.
Fatal termination always.	Fatal termination always.

WHITE.

Journal de Psychologie, Normale et Pathologique.

(Second year, No. 2. March-April, 1905.)

1. The Physiopathological Problem of Responsibility. J. GRASSET.
2. Persecutional Delirium Among Three Associates, with Self-imposed Sequestration. D'ALLONNES and JUQUILIER.
3. Clinical Report of a Case of Retro-antegrade Amnesia following hanging, with Bibliography. SERIEUX and MIGNOT.
4. Note upon Psychasthenic "Distress." P. HARTENBERG.

1. *The Physiopathological Problem of Responsibility.*—As is well known, there is much confusion among medical witnesses, when testifying in court, in regard to the degree of responsibility possessed by the prisoner. Grasset attempts most ingeniously to explain the *raison-d'être* of this confusion and to suggest a way whereby it may be avoided. In his thesis he adopts the teachings of himself, Janet and others in regard to the existence of a superior (conscious) and an inferior (subconscious) mind.

In the first place, he declares that the medical experts should always be careful to separate sharply the philosophical question of responsibility from the medical or psychophysiological question. He should, in his testimony, always limit himself strictly to the latter. Can he do so? Yes, for it will be conceded by court and expert alike that abnormal mentalization must be dependent upon abnormal anatomico-physiological conditions, and a discussion of these conditions is the medical experts' particular province. The degree of *legal* responsibility that is to be associated with these abnormal states of mentalization, borne witness to by the medical experts, is a question solely for the court to decide. Medical responsibility is, or may be, something quite different from legal responsibility, hence the confusion surrounding this question when it is under discussion in a criminal court.

Grasset then further discusses medical responsibility and shows that there are three sets of mental diseases, as it were, in each of which the responsibility is quite different. In the first place, he distinguishes clearly those affections of the superior mind (mental diseases) from those of the inferior mind (psychic diseases). Herein he shows that the terms psychic and mental are not synonymous. Psychic is synonymous with cortical and is therefore far more general in its significance than is mental, which, in signification, is rather more limited and refers functionally only to the prefrontal lobe.

Irresponsibility accompanies the diseases of the superior mind, the true mental diseases; responsibility or partial responsibility accompanies always the diseases of the inferior mind, the mere psychoses. Mania is

an illustration of the former, hysteria of the latter. Psychic maladies that complicate mental affections must also presuppose irresponsibility. The mentalization will, of course, be abnormal in both mental and psychic diseases as well as in their mutual complications. The medical expert may consistently testify to this fact and indicate, as shown above, how responsibility, from the medical point of view, may accompany one set of diseases, attenuated responsibility another set, and complete irresponsibility still another set. It is not for him to assert, in his capacity as medical expert, how philosophy or law is to regard the degree of responsibility in these respective conditions.

2. *Persecutional Delirium Among Three Associates, with Self-imposed Sequestration*.—This is a report of cases commonly known under the name of *folie à deux*—in this instance *folie à trois*. The victims consisted of a father, mother and daughter, who isolated themselves completely for many months in their home from all social intercourse, under the influence of a delusion of persecution. The daughter, twenty years of age and apparently in perfect physical health, had not left her apartment for eighteen months. The authorities, supposing she was kept in durance by her parents, went to arrest the family. The mother at once committed suicide, rather than be dishonored, the delusions of the family being that traffickers in human flesh were striving to carry off the two women. The father and daughter were placed apart in confinement. The father had always been of a weak mind and suspicious of his wife. The latter was a domineering woman and the real head of the family. The daughter loved her father, but feared her mother. A series of articles appearing in one of the daily journals gave the direction to their particular delusion, and when a man from a neighboring town called to give some work to the painter and casually remarked that the daughter could deliver it when it was finished, the whole family at once assumed that a conspiracy was afoot to seize the daughter. From that moment on, the delusion took firmer and firmer root in the minds of all three, until finally they were in the temper of the inhabitants of a besieged city, expecting every moment an attack from their persecutors. A very complete report of the daughter's mental state, while under observation and her gradual improvement, is given. The authors discuss at some length the question of mental contagion and end by showing that for the best interests of the well as of the diseased mind a continued interest and intercourse with the external world should be incessantly kept. A narrow intellectual society is the cultural medium upon which develops readily the morbid psychic germs.

3. *Clinical Report of a Case of Retro-antegrade Amnesia Following Hanging*.—The patient was forty-nine years of age without marked hereditary antecedents. He had had convulsions in childhood, contracted syphilis at twenty, and had typhoid fever at forty-eight. He had always been egotistical and suspicious. Finally, persecutional delusions seized him and he attempted suicide by hanging. He was discovered and cut down before life was extinct. Placed in bed he exhibited a series of very intensive convulsive seizures, with biting of the tongue and lips, but without involuntary evacuations. After a number of hours there supervened a comatose state with stertor, complete relaxation and congestion of the face and eyes, lasting some hours longer. Then there occurred some co-ordinated movement, but without return of consciousness some three or four hours longer. Two days later a careful physical examination revealed nothing abnormal. During this examination the patient manifested a marvellous indifference for one who had so recently attempted self-destruction. Indeed, he displayed a high degree of abnormal satisfaction. On account of this peculiar feeling of well-being, the authors were led to study more closely the state of his memory. He recalled readily the most distant events, the dates of their occurrence and the details. The happenings of the period immediately preceding the day of

his attempted suicide were not all equally forgotten. The retrograde amnesia extended only some four or five hours prior to the suicidal attempt. All his preparations for the suicidal attempt were forgotten, and the attempt itself was vehemently denied. It is to be noted that he was oblivious to the events that were going on about him at the time and to the same degree. The physician who attended him for the first few hours had to be re-introduced to him at each visit. The anterograde amnesia was only partial. He remembered having had some suffering, having been in bed and having received the visits of a physician, but he could not recall the latter's name. The anterograde amnesia was not absolute, yet was very pronounced for a period of forty-eight hours. The disturbances of memory lasted for about a fortnight and then gradually disappeared. It was from the authors that the patient first learned of his attempt at self-destruction. His delusions of persecution, so active just before the hanging, underwent a veritable remission. He was less anxious and disturbed by them than formerly. In fine, his suicidal attempt had abruptly terminated a paroxysm of delirium. After six weeks' confinement his mental state was so much improved that he was set at liberty.

The literature, with its two score of similar reports, relating the cerebral disturbances associated with attempted hangings, is discussed briefly by the authors.

4. *Note Upon Psychasthenic "Distress."*—A definition of this symptom is given and illustrated by three cases. By the feeling of distress, occurring in many psychoneuroses, the author means neither anguish, nor restlessness, nor aboulia, nor indecision, nor fear of solitude, nor need of general supervision. He thinks it is a different and special feeling, a distinct manifestation in the long series of morbid feelings, an independent and individual affective depression or shadow, in a word, "distress" in the ordinary acceptation of the word. As one patient expressed it, "I have no need of anything; I do not fear anything; not even death; and yet my inner eyes dare not encounter the view of the life of to-morrow. I see before me, around me, only an abyss. Where will I find refuge?" The author finds this particular feeling common among his patients who have used and abused the life of pleasure and who have in time reached a high degree of neurasthenia by overindulgence, of weariness by exhaustion, and of disgust by satiety.

METTLER (Chicago).

Brain

(Vol. 28, No. 109, Spring, 1905.)

1. The Relation of the Lunacy Laws to the Treatment of Insanity. TUKE.
2. On the Intrinsic Fibers of the Cerebellum, its Nuclei and its Efferent Tracts. CLARKE AND HORSLEY.
3. Diffuse Sarcomatous Infiltration of the Spinal Pia Mater. BARNES.
4. Some Hitherto Undescribed Symptoms in Angina Pectoris. HORSLEY.
5. On a Trigeminal-Aural Reflex in the Rabbit. HORSLEY.
6. A Note on the Condition of the Tendo Achilles Jerk in Diphtheria. ROLLESTON.

Lunacy Laws.—Dr. Tuke in a forceful address brings out in strong relief the disadvantages under which the profession suffers in the treatment of mental diseases, by reason of the inadequacy of the English Lunacy Laws. Physician, patient and public all suffer. He makes a strong appeal for improvement in these laws which cannot fail to be of practical significance even for us. In England, as in this country, the making of legislation concerning the insanities has lagged woefully behind the progress of the alienists by reason of the gradually shifting point of view, particularly with regard to acute psychoses. The Englishman suf-

fers particularly in so far as the laws are concerned. We cannot go into the details at this place, because of the difference in the laws of England and the United States, but the paper is suggestive for lawmakers here as well as elsewhere.

2. *Intrinsic Fibers of the Cerebellum; Nuclei and Tracts.*—Drs. Clarke and Horsley contribute a lengthy study to the minute anatomy of the cerebellum. They say: "The cerebellum, both in its structure and function, has been the subject of much valuable research during recent years at home and abroad. The anatomy of its lobes and main tracts, their relationship to each other, and the effect upon function of the removal or injury of each of them, have been established on a sound basis. Further progress must depend largely upon a fuller knowledge of its minute structure; and the series of experiments set forth in this paper were undertaken to obtain more precise data on the true anatomical relations of the cortex of the cerebellum with its own and neighboring nuclei, and on the actual origin of the efferent tracts. Two other questions were kept specially in view:—(1) Is there a direct efferent tract from the cerebellum to the spinal cord? (2) And if such a tract really exists, is it derived from the cortex or from the nuclei; and in the latter case, from which nuclei? As far as the cat is concerned the authors believe that the results of their experiments justify the following general conclusions on the direct question whether fibers (presumably axones of the Purkinje-corpuscles) pass directly into the cerebellar peduncles or not. (1) No fibers issuing from the cortex cerebelli enter any of the peduncles. (2) All fibers leaving the cerebellum by way of the peduncles have origin in one or the other of the cerebellar nuclei. Their observations show that any given area of the cortex is in relation with a homolateral nucleus of nuclei. They have not found satisfactory evidence that the cortico-nuclear fibers cross the medial plane. The details of these relations are perhaps best shown in parallel columns as follows:

<i>Portion of Cortex Cerebelli.</i>	<i>Nucleus with which it is in Relation.</i>
1. Anterior pennate lobule.	Nucleus fastigii Nucleus dentatus
2. Posterior pennate lobule.	Nucleus dentatus
3. Flocculus, paraflocculus.	Nucleus fastigii
4. Anterior pennate lobule. Anterior parafloccular lobule Paramedian lobe.	Nucleus dentatus Nucleus globosus Nucleus fastigii Nucleus vestibuli
5. Omitted for involvement of nucleus fastigii.	
6. Culmen (five posterior folia).	Nucleus fastigii Nucleus globosus
7. Culmen and all middle lobe.	Nucleus fastigii Nucleus dentatus Nucleus vestibuli Nucleus globosus
8. Left half of lobus centralis, culmen and left four fifths of first and second lobule of middle lobe.	Nucleus dentatus Nucleus fastigii Nucleus globosus Nucleus vestibuli
9. Second lobule of the middle lobe and anterior pennate lobule.	Nucleus dentatus Nucleus fastigii Nucleus globosus Nucleus vestibuli
10. Three folia of third lobule of middle lobe.	Nucleus fastigii (Very few fibers)
11. Third and fourth lobules of middle lobe.	Nucleus fastigii

- | | |
|---|------------------|
| 12. Fourth lobule of middle lobe (pyramid). | Nucleus globosus |
| | Nucleus dentatus |
| 13. Fourth lobule of middle lobe, and two outer folia of uvula. | Nucleus fastigii |
| | Nucleus fastigii |
| 15. Whole uvula. | Nucleus fastigii |
| 16. Ventral half of fourth lobule of middle lobe, uvula, and two anterior folia of uvula. | Nucleus globosus |
| | Nucleus fastigii |
| | Nucleus globosus |
| | Nucleus fastigii |
| 17. Lobus quadrangularis and side of culmen. | Nucleus globosus |
| | Nucleus dentatus |

The intrinsic arrangement of the cerebellar cortex and nuclei can be regarded as divisible into two distinct organs, a spino-cerebellar and a cerebero-cerebellar system, of which the parts are thus arranged:

Cortex of Vermis	
1. Dorsal Spino-cerebellar Tract of Flechsig	Nucleus Fastigii
2. Ventral Spino-cerebellar Tract of Gowers	Nuclei Vestibuli
Spinal Chord	Spinal Cord
Clarke's Column, etc	Anterior Cornua
Cortex of Lateral Lobe	
1. Cerebro-cerebellar Cerebrum	Cerebrum
Temporal Lobe chiefly	Red Nucleus and Thalamus
Crus Cerebri	
outer fifth chiefly	Superior Peduncle
Pontine Nuclei	Nucleus Dentatus
Middle Peduncle	

3. *Sarcomatous Infiltration of the Spinal Pia Mater*.—Stanley Barnes contributes a study to the knowledge of the spread of multiple tumors of the central nervous system, and reports the history of the two cases in considerable detail. His conclusions are as follows: (1) If a growth originates in the caudate nucleus or in any other part of the brain and eventually finds its way to the linings of the ventricular cavities, it may "infect" the cerebro-spinal fluid. Metastatic growths may then occur in the following situations: (a) In the lining walls of the lateral, third or fourth ventricle; (b) In the meninges (subarachnoid) at the base of the brain; (c) In the pia mater and the arachnoid around the spinal cord; and (d) In the posterior root ganglia, particularly of the cauda equina. (2) In all probability diffuse sarcomatous infiltration of the spinal pia-arachnoid, which is occasionally found post mortem, is in all cases the expression of a sarcomatous infection of the cerebrospinal fluid as a result of some primary growth which lies exposed to the stream of the cerebrospinal fluid high up in the nervous system. (3) The regions affected by such secondary growths are exactly the same as those affected by tuberculous meningitis after the rupture of a tuberculous "tumor" of the brain.

4. *Angina Pectoris*.—G. A. Gibson gives a clinical lecture on some hitherto unobserved symptoms in angina pectoris, dealing particularly with sensory changes as seen in a patient 45 years of age suffering from this disease. The real importance of this case lies in the opportunity which it affords of giving a clear demonstration of certain facts regarding the afferent impulses from the heart; the symptoms exhibited by the patient allow the possibility of tracing out the course of these paths. Passing

up from the receptive end organ, by the cardiac nerves to the cervical ganglia of the sympathetic, they pass in by the gray rami communicantes to the posterior spinal roots, and thence run upward in the ascending tracts of the spinal cord. In the cortex cerebri the impulses which are produced give rise to sensation, but, as Head puts it, "the sensory and localizing power of the surface of the body is enormously in excess of that of the viscera, and thus by what might be called a psychical error of judgment, the diffusion area is accepted by consciousness and the pain is referred on to the surface of the body instead of on to the organ actually affected." The result is that the patient seems to feel uneasy or painful sensations over the precordia, shoulder and upper extremity. That the cervical sympathetic is involved in this case cannot be denied on account of the ocular phenomena, and the history may be taken as a proof of the contention that this system is a means of conducting afferent impulses from the heart.

5. *Trigeminal-Aural Reflex*.—Dr. Horsley contributes a physiological study of the reflex of the ears in rabbits.

6. *Tendo Achilles Jerk*.—Dr. Rolleston contributes a report of his observation of 100 cases of diphtheria in which the Achilles jerk was investigated up to the time when the patient began to sit up. This period necessarily was widely varied by the severity of the case, the condition of the heart, and the presence or absence of paralysis. In some cases it was as short as twenty days, and in others extended to sixty-three from the onset of the disease. The observations were made with the patient in a recumbent position. In twenty cases the Achilles jerk was completely lost, and in twenty-seven was found to be sluggish. In the other fifty-three cases it remained fully active throughout the whole period. The author summarizes as follows: (1) The tendo-Achilles jerks are affected in a considerable proportion of all cases of diphtheria, though less frequently than the knee jerks. (2) The frequency and extent to which they are affected bear, like albuminuria and paralysis, a direct relation to the character of the initial faucial attack. (3) They are completely abolished in all cases of diphtheritic paraplegia. (4) Their absence may be the only evidence of loss of power in the lower limbs. (5) Like the knee jerks, they are liable to be affected at an early stage of the disease, and to remain absent after disappearance of all diphtheritic paralysis, properly so-called. (6) Like the knee jerks, again, they may be unequally affected on the two sides, and, like the former, they may be unusually brisk before they become sluggish and disappear. (7) The Achilles jerk, like the knee jerk, after it has been lost, may reappear on one side before it does on the other. JELLIFFE.

Deutsche Zeitschrift für Nervenheilkunde.

Band 24, 1905, Heft 3-b.

6. Studies of a Case of Hemicephalus, with Contribution to the Physiology of the Human Central Nervous System. I. Anatomical Section. II. Clinical Physiological Section. STERNBERG and LATZKO.

7. The Contraction of the Sphincter iridis in Convergence, and the Convergence and Lateral Movements of the Eyeballs. An Experimental Study. MARINA and COFLER.

8. Contribution to the Casuistry and Etiology of Intermittent Claudication. IDELSOHN.

9. A Contribution to the Knowledge of Herpes Zoster. HEDINGER.

10. Brief Communications. I. Remarks upon the article "The Etiology and Pathological Anatomy of Tumors of the Frontal Brain," by Dr. Ed. Muller, Vol. 23, Heft 5 & 6, p. 378. AUERBACH. II. Reply to the Preceding Remarks of S. Auerbach. MULLER.

6. *Hemicephalus*.—By hemicephalus Sternberg means partial absence of the brain, the medulla oblongata and, perhaps other parts, being still recog-

nizable macroscopically. His subject was a new-born child with a typical malformation of the head, and a mass about the size of a pigeon's egg springing from the base of the skull and occupying an orifice in the hairy scalp. Through this mass of tissue a funnel-shaped opening communicated with the fourth ventricle. The spinal cord, medulla and remnants of the pons, were present. The spinal cord was 17 centimeters long. The microscopical description, in spite of defects in preservation and consequent impairment of the staining, is minute. For the details reference must be made to the original. It showed that the central nervous system had been well formed as far anteriorly as the locus coeruleus, and that there were small particles of tissue that evidently represented atypical fragments of other parts of the central nervous system, including the cerebellum, which was attached to the medulla oblongata. The spinal cord was diminished in size. The medulla oblongata showed absence of the pyramids, the olivary bodies were abnormal, and the central canal remained closed. The pons was greatly reduced in size, and contained no medullary substance. In the spinal cord the posterior columns formed the largest portion of the white substance. The central canal was nearer the ventral surface of the cord, and there were certain resultant malformations of the gray matter. The central nervous system lacked the cerebrum, the mid-brain and the pyramidal tracts; the cerebellum was reduced to a slight communication with the restiform body, and there were a variety of other defects involving various nerves and other structures. Sternberg has carefully collected all the records of anencephalic and hemicephalic monsters who have lived after birth. His own subject was born alive. Before birth, when the finger was thrust into the child's mouth it made active sucking movements. It breathed without assistance, and began to cry vigorously. It nursed vigorously from the bottle, and during nursing a few drops of a clear liquid were expelled from the opening in the skull. Two days after birth its temperature was abnormal, the face cyanosed, the eyes open, but could be closed, the mouth usually open, but also from time to time it was closed. Touching of the eyelids caused prompt closing of the eyes. Touching the cheek with ice caused a deep inspiration. The mucous membranes of the nose were sensitive. The reaction of the pupils to pain was not present; the other reactions could not be determined. The child was apparently deaf. The left hand showed a slight inclination to claw-deformity. The child grasped an object with either hand. There was a slight spasticity, but the arms and legs were capable of spontaneous movement. There was apparently a Kernig's sign. The patellar reflex was multi-muscular, crossed and exaggerated. The Achilles tendon reflex could not be elicited. The child died at the end of sixty hours. On account of its weak condition when first seen two days after birth, the examination was not complete. It appears, therefore, that certain reflexes are situated rather low in the nervous system. Among these are the sucking reflex, the crying reflex, the inhibition of the crying when food was given, the reflex due to pain or disagreeable stimuli, the mimic reflex, the reflex for sighing and for closing of the eyelids. It is particularly interesting to note the movements in the upper extremities which involved a good deal of co-ordination, and were as well performed by the child under observation as by a normal child. In this case grasping of the fingers was observed for the first time in a hemicephalic. There was no tendency to protect itself from disagreeable stimulation, such as tickling the mucous membranes of the nose.

7. *Lateral Eyeball Movements*.—Marina and Cofler call attention to the fact that in transplantation of the various muscles controlling the movements of the eyeball there is a longer or shorter interval in which strabismus occurs, but this gradually disappears and the movements of the eyeball become physiologically correct. All these experiments were performed by Dr. Cofler upon apes. When the power of convergence was restored in these animals it was noted that the pupils contracted normally,

showing that the convergence reaction had nothing to do with the centers of innervation of the ocular muscles, or with the nuclei of the ocular muscles. There were also some interesting conclusions regarding the actions of the various muscles. In one case he had a muscle torn and cut, and then studied the oculomotor nuclei and found a localized area of cell reduction.

8. *Intermittent Claudication*.—Idelsohn reports fourteen cases of intermittent claudication. There were eleven men and three women, the ages ranging from twenty-seven to fifty-nine years. There was frequent absence of the pulse in the dorsalis pedis artery. It was only distinctly present in four of the twenty-eight feet. The pulsus tibialis posticus was only distinctly palpable in five of the twenty-eight legs. In eight cases there was a bilateral flat-foot. Of the fourteen patients twelve were Jews, and other statistics indicate that this race is peculiarly subject to the disease, furnishing forty-nine of fifty cases collected by Hegier and Goldflam. Idelsohn believes that the cause of the disease is an abnormal construction of the vascular system, or a diminished resistance of the blood vessels. He is rather inclined to discredit any important etiological connection between the disease and alcohol, tobacco, syphilis, or even flat-foot. Neuropathic heredity does not appear to play an important role.

9. *Herpes Zoster*.—A man of fifty-seven who had syphilis some years before had failure of compensation, and eighteen days before his death developed a zoster extending from the posterior median line to the anterior median line on the left side, in the region of the eleventh dorsal root. At the autopsy, besides lesions of the heart, lungs and kidneys, there was a large colloid tumor in the retro-spinal region. There was a perivascular lymphocytic accumulation most marked in the left posterior horn of the spinal cord, and at the level of the 11th and 12th dorsal segments. At the level of the 11th dorsal segment there was also an area of degeneration in the left pyramidal and cerebellar tracts which extended obliquely downward and outward. It was not observed below the eleventh, and became rapidly less upward and disappeared at the level of the ninth dorsal segment. Some degenerated fibers were found in the eleventh dorsal posterior roots; elsewhere the spinal cord and the posterior roots were normal. The eleventh dorsal ganglion showed an extraordinary degree of cellular infiltration composed almost exclusively of lymphocytes. There was also proliferation of the connective tissue. The ganglion cells were degenerated. There were two small necrotic areas in the ganglion, and also some degeneration of the fibers. There were slight changes in the 10th and 12th dorsal ganglia. The skin at the site of the eruption showed considerable round-cell infiltration. There was also a hydropic degeneration of the cells of the rete Malpighi. In the deeper layers of the skin the round-cell infiltration was found chiefly in the neighborhood of the sweat glands and blood vessels. The case may be regarded as a confirmation of the conclusions of Head and Campbell that herpes zoster is due to disease of the ganglia of the posterior roots.

10. A bitter controversial article between Auerbach and Muller regarding the value of the former's article concerning the functions of the frontal lobes.

J. SAILER (Philadelphia).

Miscellany

UNILATERAL TRANSITORY ABDUCENS PARALYSIS. M. Wiener (Journal A. M. A., August 26).

The author reports four cases of transitory, unilateral abducens paralysis, unassociated with any other ocular paralysis or with any tangible disease. All the patients were females, two of them children, aged 9 and 12 years, respectively; one was a girl of 16, and one a young woman of 28. All four were apparently cured by small doses of sodium bromid and suggestion. He reviews other cases in the literature, and thinks that the facts demonstrate that a functional, or hysterical, paralysis of the abducens does occur without there being necessarily any other hysterical signs, a fact that is of diagnostic as well as prognostic importance.

CONCERNING SURGICAL INTERVENTION FOR THE INTRACRANIAL HEMORRHAGES OF THE NEW-BORN. BY HARVEY CUSHING (The American Journal of the Medical Sciences, October, 1905).

The author states that the indications for immediate surgical intervention in these cases are as definite as for traumatic intracranial hemorrhage in adults. The vessels most likely to rupture are those which ascend over the cortex from the mid-cerebral region and enter the superior longitudinal sinus. The veins are apparently unsupported as they leave the subarachnoid space; cross the subdural space and enter the sinus, and this circumstance in connection with the overlapping of the parietal bones, which occurs in labor, causes frequent tearing at this point. The diagnosis is based upon the history of difficult labor or postpartum asphyxiation; bulging fontanelles; convulsion which, especially when coming on late, may be unilateral; undue reflex activity; ocular palsies or differences in size of the pupils; and in severe cases symptoms referable to the medulla oblongata such as alterations in the cardiac or respiratory rhythm. In the early days evidence of paralysis is rare. There may be no difference in the two sides, even if the lesion is unilateral. Lumbar puncture aids in the diagnosis. The author reports four cases with operation. Two of the patients died—one during operation and the other about eight hours after the operation, which was apparently borne well. The two who survived high, 60.3%.

C. D. CAMP (Phila.)

CEREBRO-SPINAL MENINGITIS. BY N. B. FOSTER. (The American Journal of the Medical Sciences, June, 1905.)

The paper is a study of thirty cases occurring in an epidemic in New York. Statistics are given as to the etiology, mode of onset, symptoms, blood changes and complications. The meningo coccus was regularly found in the cerebro-spinal fluid withdrawn by lumbar puncture and is the only means of certain diagnosis. When repeated every two or three days it has also a therapeutic value. In one case in which 5 c.c. of 1% solution of collargol was injected after a lumbar puncture, it was demonstrated in the ventricles of the brain at autopsy twelve hours later. The mortality was high, 60.3%.

C. D. CAMP (Phila.).

A STUDY OF BRACHIAL BIRTH PALSEY. BY L. P. CLARK, A. S. TAYLOR and T. P. PROUT. (The American Journal of the Medical Sciences, October, 1905.)

After a historical introduction, the results of the dissection of ten infants, dying from three to ten days after birth, is given in order to determine the anatomical factors in the etiology of the condition. Seven cases of brachial birth palsey were operated on by the authors' method. The histories of the cases and technique and results of the operation, together with pathological reports on the material removed, are given in detail. The authors conclude that the cause of the laceration type of birth palsey is tension on the nerve trunks, which first causes rupture of the perineural sheath and then of the nerve fibers with an accompanying hemorrhage into the nerve substance. In order to avoid this the obstetrician should not everstretch the child's neck in the process of delivery. The persistence of the palsey is explained by the formation of hematoma, which, by their organization, form cicatricial contraction strangulating the nerve fibers. Palliative treatment is demanded at first to prevent contractures and maintain muscle tone until spontaneous recovery or operation (traumatic neuritis is a contra-indication to active treatment). As soon as it is proven that spontaneous recovery will not take place, the nature of the lesion demands that in all cases the damaged area should be excised and the divided ends sutured. In the authors' opinion, one year is a reasonable time in which to determine this point. In the seven cases reported, two died after the operation, two were decidedly improved, one is beginning to show improvement, and in the last two sufficient time has not elapsed to show results. The ages at operation of the two cases showing the decided im-

provement were ten and eight years respectively. C. D. CAMP (Phila.).

CLINICAL INVESTIGATIONS OF THE DIGESTION IN THE INSANE. BY D. M. COWIE and FLORENCE A. HILL. (The American Journal of Medical Sciences, September, 1905.)

Twenty-two cases of various types of depressive insanity were carefully examined and full histories of the cases with details of the methods used, and their results are given in the original paper. In 81.8% of these cases there was a hyperacidity of the gastric contents, which was due to a true hyperchlorhydria. There was also increased peptic power and rapid evacuation of the stomach. That the increased secretion is due to a neurosis or psychosis and not to proliferative glandular changes is evidenced by the presence of increased secretion, associated with degenerative changes in the glandular elements and in the entire mucosa. Many of the insane are suffering from various forms of gastro-intestinal disease, which might be overlooked because delusions connected with the digestive tract are so common in these patients, whereas, if properly treated, it is not improbable that the mental symptoms will decrease. C. D. CAMP, (Phila.).

NOTES ON OTETIC EPILEPSY. BY B. ALEX. RANEALL. (The American Journal of the Medical Sciences, August, 1905.)

Many of the cases of epilepsy reported as due to the presence of cerumen or other foreign bodies in the ear are hysterical rather than epileptic, but this case the author considers to have been a case of genuine epilepsy clearly otetic in origin and maintenance. A boy eight years old first developed epileptiform attacks following acute suppuration of the left ear. The attacks were of short duration and slightly more marked on the right side of the body than on the left. On examination the left ear was found to contain a polyp mass, which was removed, and the attic and antrum curetted smooth. This operation gave no relief, the minor attacks being as frequent as twenty in one night. About two months later a complete exenteration of the left mastoid was performed, much granulation and unhealthy bone were found, but its inner depths were everywhere sound. In the following two months there was a marked diminution in the frequency and severity of the attacks since followed by complete cessation.

C. D. CAMP (Phila.).

DIPHATHEROID ORGANISMS IN THE THROATS OF THE INSANE. BY J. W. H. EYRE and J. F. FLASHMAN. (The British Medical Journal, Oct. 28, 1905.)

As a result of the examination of the throats of sixty cases of general paralysis of the insane and of seventy-eight of various other forms of insanity, the authors arrive at the conclusion that the percentage incidence of diphtheroid organisms (17.8%) and of genuine *B. diphtheriae* is not in excess of that noted on the healthy sane and that genuine *B. diphtheriae* are no more frequent in the throats of general paralytics than in the throats of patients suffering from other forms of insanity. They were unable to trace any causal connection between *B. diphtheriae* and general paralysis of the insane.

C. D. CAMP (Phila.).

BOOK REVIEWS

THE PSYCHIC TREATMENT OF NERVOUS DISEASES. BY DR. PAUL DUBOIS.
Translated and edited by Smith Ely Jelliffe, M.D., Ph.D., and
William A. White, M.D. Funk & Wagnalls, New York and
London.

At the present time when the organized forces of Christian Science and the free-lance "healers" of diverse kinds are gathering in such sweeping harvests of the credulous and unthinking, and invading to a considerable extent the minds of persons generally sensible and thoughtful, it is distinctly worth while that these latter should have pointed out to them, and not only pointed out but explained with delightful lucidity the successes and the methods of a man who has accomplished results quite as miraculous in appearance as any authentic cures made by the "scientists," but without recourse to anything more mysterious than straight thinking and patient "persuasion." Such a service has been done for those who will read it by Prof. Dubois's book, "Les Psychoneuroses," and made available to English readers by the translation of Drs. Jelliffe and White.

The work was originally in the form of a series of lectures to the Faculty at the University of Berne, and still retains something of the leisurely style of the spoken discourse. That this is a recommendation rather than a defect in the case of an author possessed of so charming a personality as Prof. Dubois, a very cursory examination of the book will serve to convince. The translators have evidently been at some pains to preserve the manner as well as the matter of the original, and in some instances have not hesitated to substitute for a literal rendering of the French something characteristically English in the way of phrase or figure.

Yet it would be a mistake to suppose that the work is lacking in unity, in structure. On the contrary, the whole thing is put together after the manner of a skillful periodic sentence, and only upon reaching the "conclusions" of the 35th chapter does the reader fully realize how the preliminary clearing of the ground, the laying of the foundations and the rearing of the superstructure are inevitably crowned by the pinnacle from which so wide and enlightening a view is obtained. If the author had begun with a description of his treatment and an assertion of his results, many would have taken up the book only to put it down again without conviction. But chapter after chapter is spent in historical résumé, in discussion of philosophical problems bearing on the subject, in definition of terms and in analysis and classifications of the disorders in question, before the treatment adopted so successfully by the author is more than implied. When at last that treatment is described and the history of individual cases given, the reader is ready to understand and appreciate to the utmost.

The whole book is absolutely frank. It makes no unsupported claims, no unwarranted interpretations, no half revelations. Theory, method and result are placed unreservedly at the disposal of all, and although one might well doubt his own ability to accomplish all that the tact, patience and charm of Prof. Dubois have done, still it is indisputable that the assimilation of his theories and the adoption as far as is feasible of his methods cannot fail to make the work of any practitioner more effective.

It is not often that a book appeals to as many classes of persons as does this. With much in it to interest the specialist, it is equally well calculated to be an inspiration and guide to the general practitioner, and although written without any of that "popular" idea which has been the

excuse for so much inaccurate and slipshod pseudo-science, it is still so clearly and simply put, with so much of "human interest," that the layity will find it both absorbing and inspiring, even if the part which deals with "dualistic spiritualism" and such matters proves beyond those uninterested in philosophy as such.

On the one hand, the public will find that they are free to recognize and utilize the power of mental representations in the treatment of disease without having recourse to the hypnotism which is to some a word of terror, or without abandoning their personal independence of intellect. In fact, the old assertion that "man is man, and master of his fate" never had a more sane and cheerful exposition than the one given here.

On the other hand, those members of the medical profession who have distrusted all "psychotherapy" as associated with more or less hysterical superstitions which it was their duty to combat will find the matter here treated in a true scientific spirit, and should gladly welcome the addition to their armamentarium.

To give any summary of the contents of the book would be quite impossible within the limits of a brief review, and if some idea can be conveyed of its tone and impression, the reader will certainly wish to look further for himself.

GOODALE.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. EDITED BY SOLOMON SOLIS COHEN, A.M., M.D.

Volume X.—*Pneumotherapy*, including Aërotherapy and Inhalation Methods and Therapy, by Dr. Paul Louis Tissier.

Volume XI.—*Serum Therapy*, by Joseph McFarland, M. D.; *Organotherapy*, by Oliver T. Osborne, M.A., M.D.; *Radium, Thorium and Radio-Activity*, by Samuel G. Tracy, B. Sc., M.D.; *Counter-Irritation, External Applications, Bloodletting*, by Frederick A. Packard, M.D.; *An Outline of the Principles of Therapeutics with Especial Reference to Physiologic Therapeutics*, by the Editor; with addendum on X-Ray Therapy and an Index-Digest of the complete system of eleven volumes. Illustrated. Philadelphia, P. Blakiston's Son and Co.

These two volumes, completing the system of Physiologic Therapeutics, are on a par with their predecessors, which we have successively reviewed. In Volume X Aërotherapy and Inhalation Methods are presented from the Parisian point of view, Paris being the center of modern study in pneumotherapy. The effects and uses of compressed and rarified airs, differential pressure, respiratory gymnastics, etc., and of the inhalation of gases: oxygen, nitrogen, carbon dioxide, formaldehyde, etc., with the necessary apparatus are described in great detail, the text being accompanied with numerous illustrations and diagrams. The Caisson Disease gives a minute study of certain effects of compressed air, and balloon ascensions and mountain-climbing, illustrate rarefaction; and in describing the apparatus for bringing about such conditions at will, the author notes their effects on blood-pressure, gases in the blood, air in the lungs, digestion, intestinal distension, etc. Most of this apparatus is complex and suitable for instalment only in the largest establishments. In the section on Inhalation we get some very useful information for use in practice through a discussion of the drugs available for vapor or spray.

Volume XI, the index-volume, completes the series, and, for its consideration of treatment by serums, animal extracts, radium and X-rays, subjects not yet adequately handled in text-books, is most welcome. One may read here of the newer immunity hypotheses, of tuberculins, of antitoxins, of antityphoid and antitetanic serums, of thyroid, of adrenalin, of ovarian extract. The therapeutic data seem to be thoroughly up-to-date, and the author shows a commendable conservativeness in dealing with these newer remedies. Not the least important part of the book is an extended chapter by the editor, Dr. Cohen, entitled "An Outline of the

Principles of Therapeutics with Especial Reference to Physiological Therapeutics." The therapeutic index to the eleven volumes, occupying one hundred and twenty-five pages, is comprehensive, and would seem to have been prepared with great care. The editor of this system is to be congratulated on his successful presentation to the profession of the subject of physiologic therapeutics. BASTEDO.

SPECIES AND VARIETIES; THEIR ORIGIN BY MUTATION. HUGO DE VRIES, Professor of Botany in the University of Amsterdam. Edited by D. T. MacDougal. Open Court Publishing Co., Chicago.

The problems of evolution have always attracted the minds of scientific men, no matter in what line of inquiry they may have interested themselves. Botanists and zoologists, working either in systematic fields or with more limited biological problems, have always felt a certain sense of fascination in this line of research.

It need hardly be recalled that hypotheses of long time evolution have held sway up to within the last thirty or forty years, and that even at the present time there are many who believe that the genealogical tree of a species runs back thousands of years into the dim past. The recent evidence, however, not only coming from so able a botanist as De Vries, who for twenty years has been pursuing the solution of the problems of evolution, but from all sides, is tending to show that new species may originate by sudden leaps, or, as De Vries and others have termed it, by mutation, and that from the seed of any one plant several such mutations and true species may arise.

The present volume deals with the detailed discussion of the evidence that De Vries has gathered bearing on this point, and presents his latest contribution to the subject of evolution, no less important than the epoch-making work of Darwin. The facts and details which furnish the basis for his mutation hypothesis are here presented in a readable and systematic manner. Historical data, problems of heredity and descent are included in these twenty-five chapters. We can most cordially recommend to our readers, particularly those who have memories of their botanical studies still in mind, this interesting series of lectures. JELLIFFE.

A TREATISE ON THE NERVOUS DISEASES OF CHILDREN FOR PHYSICIANS AND STUDENTS. BY B. SACHS, M.D., Alienist and Neurologist to Bellevue Hospital, and Neurologist to the Mt. Sinai Hospital, etc. Second edition, revised. William Wood and Company, New York.

The fact that Dr. Sachs' book is asked for in a second edition after but three years shows two things: First, how commendably widespread is the interest in children's diseases, and how much it is appreciated that in every department they are quite distinct from the diseases of adults; and, secondly, how well Dr. Sachs' work has been done, making it of very great value for those who are interested in the subject. The fact that it has been translated into German and Italian, and that a French edition is in preparation, shows how much the work has been appreciated. With very few exceptions there is in recent years no work of American Medical Literature that has attracted more widespread attention than this. Dr. Sachs has done well in reducing the size of the book by omitting the chapters on anatomy and physiology which are to be found in all the ordinary text-books on nervous diseases. As it is now, the book deserves high commendation for its orderliness, its completeness of details, its suggestiveness in matters of treatment, its helpfulness in diagnosis, and the very clear method of presentation which characterizes it. The author's revision for this second edition has added much new material and has brought the work thoroughly up to date. There is nothing with regard to the nervous affections of children which seems to be lacking in it, and

we heartily commend it to those who are looking for a treatment of this difficult subject.

We can scarcely refrain, however, from a remark with regard to the book-making. Altogether the book contains about 550 pages, or with the index 570, and yet, owing to the paper used in it, it has become a heavy, cumbersome volume, quite tiresome to handle. Why cannot we have the real hand books printed on lighter paper, with lighter binding, such as are so common in England and France.

WALSH.

KRIMINALPSYCHOLOGIE UND STRAFTLICHE PSYCHOPATHOLOGIE AUF NATURWISSENSCHAFTLICHER GRUNDLAGE. VON ROBERT SOMMER, M.D., Ph.D. O., Professor of Psychiatrie in the University of Giessen. Johann Ambrosius Barth, Leipsig.

Prof. Sommer has always interested himself in the relations of the criminal character to psychological norms. The son of an eminent jurist, since 1894 he has contributed regularly to the subject, at first to the Dresden Society for Psychiatry, and later his work at Giessen has brought him very closely in contact with social defectives. These have been welcomed in his clinic at Giessen, and much progress has been made in the study of the criminal types.

The present work does not attempt a thorough discussion of criminal psychology. After an introductory chapter on the German criminal code, he takes up various examples of deviates, whose variation from average standards is liable to bring them into conflict with the social safeguards. Various psychopathic states are discussed, special chapters being devoted to imbecility, dementias, paranoia, etc. The epileptic type is thoroughly analyzed. Especially interesting chapters are those on "Prison Psychoses" and on "Simulation of Insanity." The latter is particularly suggestive and helpful.

The author has been instrumental in bringing the modes of procedure with reference to criminal law more in accord with the teachings of modern psychiatric science, and chapters 17, 19, 20 and 22 are full of well-considered ideas bearing on this important topic. The work is a very worthy one.

JELLIFFE.

A TREATISE ON DISEASES OF THE NERVOUS SYSTEM. BY L. HARRISON METTLER, A.M., M.D., Associate Professor of Neurology, College of Medicine of the University of Illinois; Professor of Mental and Nervous Diseases in the Chicago Clinical School; Consulting Neurologist to the Norwegian Deaconess' Home and Hospital, Chicago. Cleveland Press, Chicago, 1905.

Mettler's book is a big one, six pounds and a half avoirdupois. Its scope, however, is far from exhaustive. The reason for this appears to be that the author spends much time on principles, essaying to deduce symptoms from the physiology of disease. This is an admirable design, but hard to execute, and the author at times is exasperated by his difficulties. Only thus can we account for his attacks (p. 630) upon those who, he says, "must show how a relatively inert nerve fibre . . . can . . . give rise to the most excruciating agony . . . in opposition to all the teachings of physiology;" or (p. 40) his gloating over those unfortunates "pushed to the wall" for speaking of functional diseases as "without change of structure;" or (p. 716) his invective against "some physiologists" with their "narrow way" of limiting the cortical centers—"puerile, grossly materialistic and absolutely unwarranted by any scientific proof worthy of the name;" or (p. 791) his disgust with "this so-called higher visual center" which "is not only hypothetical but unsupported by the slightest shadow of anatomical evidence. It is a sorry makeshift from one dilemma into another." Surely this polemic manner is out of place in a text-book.

Dr. Mettler uses the neurone doctrine for classification. "Neuronic Diseases" embrace the system diseases and the neuroses; the non-neuronic the remainder. "The present treatise has been written with the view of presenting the subject of neurology in consonance with this doctrine" (Preface).

Just what Dr. Mettler means by the neurone doctrine is not clear. It is said to cast a "brilliant illumination" upon "the entire field of neurology" (Preface) and to be "one of the grandest and most useful generalizations," etc. (p. 472).

If Dr. Mettler means conceptions like Gowers', of upper and lower segments in the motor pathway; or Spiller's, of the unity of Landry's syndrome in affection of the lower motor segment; or Patrick's, of the kinship between Friedreich's and Marie's family ataxia through the posterior spino-cerebellar system, then the "neurone doctrine," if not exactly "grand," is surely "most useful." Yet these conceptions came independent of any formulated doctrine; they may strengthen a doctrine and be in turn strengthened by it, but the final verdict as to the neurone doctrine will rest on histological studies like Bethe's and Apáthy's. As the doctrine of the Vicarious Atonement, immeasurably important in theology, has nothing to do with Ethics, so of the Neurone Doctrine in its present phase, it seems that it has little to do with the practice of neurology.

Lord Bacon regarded it as a fault of young men to "pursue some few principles which they have chanced upon," but he does not say there is much harm in it. Mettler's classification is really like others. The objection is only to its esoteric character and its over-estimation of the mere rubrics of our specialty.

Dr. Mettler has a turn for psychology; but he is not always happy in it: thus "A psychosis means a mental aberration, an unusual exhibition of mental manifestation" (p. 754) and "Speech, reading and writing . . . are the expression of a high order of psychosis" (p. 717); "Psychic visual memory and comprehension is probably *co-extensive with all of the brain functions. Visual hallucinations are psychic symptoms that happen to be in the visual sphere*" (p. 792). (May the student then logically complete the syllogism thus—visual hallucinations are psychic symptoms that happen to be co-extensive with all of the brain functions?)

Dr. Mettler parleys in some places inopportunately; of the Babinski sign (p. 56) he says: "This is a most important criterion of disease, though its fullest significance we have yet to learn;" and he fails to give a hint of what it does mean. On page 77 he says: "Wernicke and Oppenheim claim they have observed a tactile paralysis that is a mental anesthesia. With the sensibility intact in the hand objects could not be recognized by touch." Why not call it astereognosis, since the term is commonly used? On page 634 it is said: "As an isolated paralysis the peroneal is far more frequently affected than the tibialis posticus. In my own opinion there is a developmental, biological reason behind this." Is not the head of the fibula behind this, rather; or in some cases the pyramidal muscle. Why oppose so loudly as on pages 421 854, 860, the ordinary use of "paraplegia"?

We trust mere heedlessness accounts for the statement on page 427, and repeated on page 646, that the sixth nerve arises from a nucleus in the floor of the Aqueduct of Sylvius; and on page 427, that chronic "poliomyelitis is an inflammation," "no more systemic in character than cerebral embolism" (the degenerative origin is the rule undoubtedly), and on page 860, that athetosis "resembles exactly a true chorea, except in being so localized;" and on page 39, that "overgrowth of the connective tissue" constitutes sclerosis, while "The neuroglia usually proliferates also;" and on page 758, that hallucinations conforming to a patient's delusions are what "Baillarger calls psychic or pseudo-hallucinations" (Baillarger called psychic hallucinations and Hagen pseudo-hallucinations, the

soundless "spoken" words later named motor hallucinations; on page 755, hysteria due to physical disease is "a physical phenomenon" unlike other hysteria which is functional.

Far less serious faults in Mettler's book, but annoying by their frequency, are tautology and redundancy; as in "all of the attending circumstances surrounding the patient" (page 42) "the changes in the muscles undergo a more or less regular and uniform process;" and (p. 22) "the gait assumes a characteristic manner;" and (p. 520) "the osseous vertebrae;" and (p. 791) "homonymous bilateral hemianopsia of one side;" and (p. 971) "Rheumatoid arthritis, tetany, Raynaud's disease and exophthalmic goitre . . . may all pass insensibly into each other as members of one family, *owning one common parent origin*, a cerebro-spinal toxemia;" and (p. 911 of syphiloma and tuberculoma) how to "distinguish them apart."

We have forgotten how the grammarians classify such sentences as "Nationality seems to have no deterring influence for or against it" (paresis, p. 889); and "The sphincters are generally included in the final symptoms" (page 522); and "organic gross . . . lesions . . . regarded as epileptic" (p. 772); and "Traumata . . . is" (p. 619).

A good feature of the book is the clear type. The illustrations, however, are inferior.

WILLIAM PICKETT.

GRUNDRISSE DER HEILPAEDAGOGIK. VON DR. THEODOR HELLER, Direktor der heilpaedagogischen Anstalt Wien-Grinzing. Wilhelm Engelmann, Leipzig. Paul B. Hoeber, New York.

Scientific pedagogy has undergone many changes in recent years. The Herbartian principles have been the guiding stars for decades, and strange as it may appear, even now, while his influence has received a severe setback from the attacks of Kraepelin and other alienists, many American teachers are discovering Herbart and pushing his cult. Stanley Hall has criticized, and, prematurely, what he is pleased to call the lack of interest that physicians have taken in the practice of pedagogy, but it is certain that from many of this fraternity the most important impulses have come which even made his memorable work on Adolescence possible.

While here and there, and in isolated localities, straightforward efforts have been made to follow out the principles of Seguin and other leaders, to bridge over the gap, as it were, between pedagogy and medicine by training defectives, there has been a dearth of trustworthy and useful guides to place in the hands of the eager teacher. For the German reading student this work of Heller makes a striking attempt to supply that very need.

The study of the pathological has always aided in the study of the normal, and one who has spent time with defective intellects is better able to appreciate the average mind and to minister to its needs in a truer sense than one who has kept the eyes closed to the abnormal.

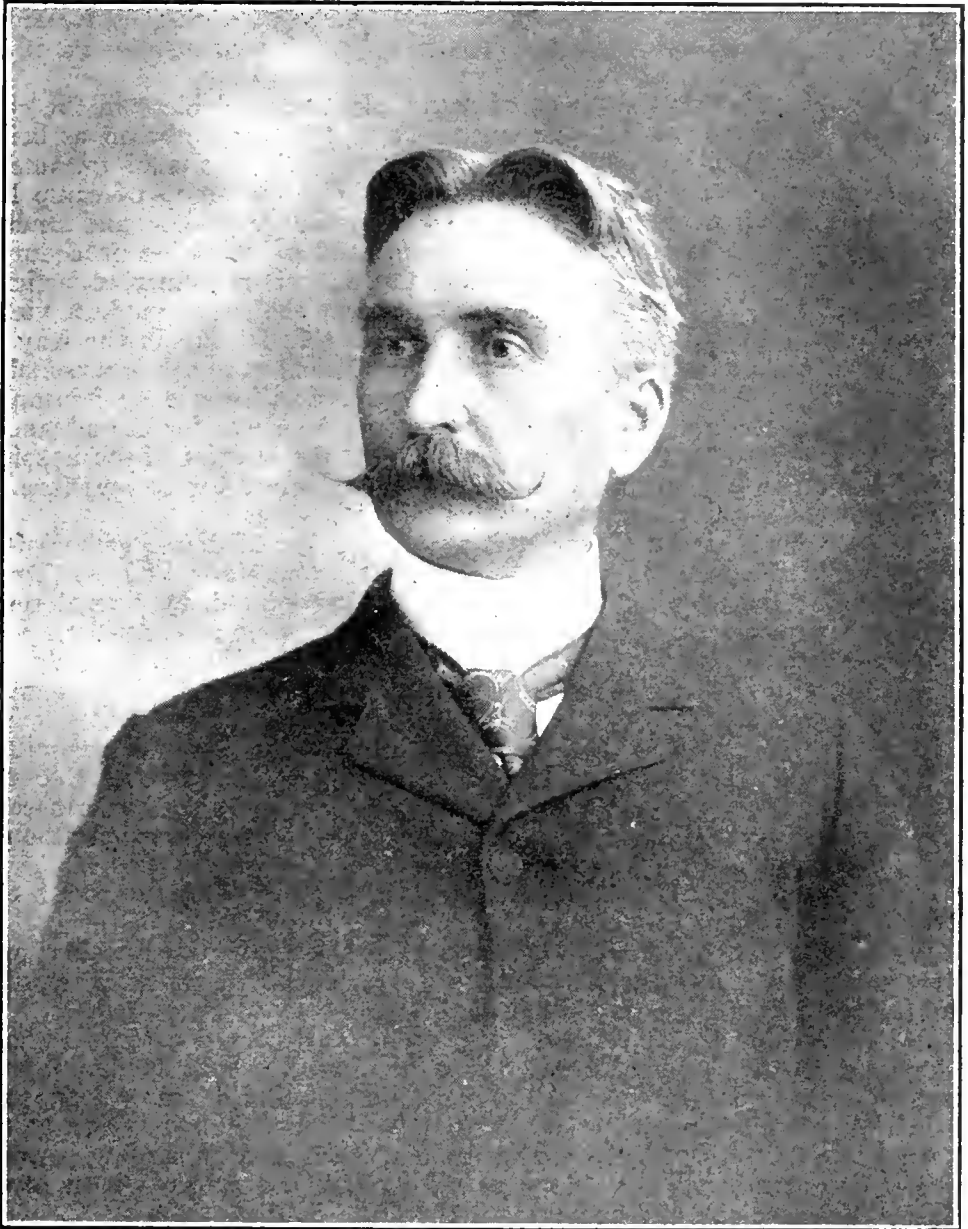
The work in consideration deals for the most part with the training of the mental life of defective and nervous children of all classes and kinds. Chapter heads such as "Definition and Classification of Idiocy," "Complications of Idiocy, Moral Degredation, Epilepsy, Tics, Masturbation;" "Speech Disturbances of Weak-Minded Children;" "Symptomatology of Idiocy;" "Etiology of Idiocy;" Cretinism and Mongolianism; Curative Pedagogy; Therapy and Prophylaxis of Nervous Conditions of Childhood and The Care of Weak-Minded and Nervous Children; these give a comprehensive glance over the subject matter of this very interesting volume.

Of the manner of the performance there is nothing but praise. A work of this kind will prove of great service to teachers, physicians and parents.

JELLIFFE.

News and Notes

EMMET COOPER DENT, M. D., OF NEW YORK.—Dr. Dent was born in Macon, Miss., in 1857. He was a descendant of the Dents and Witherspoons of Maryland and South Carolina, who were prominent soldiers and statesmen during the Revolutionary period. He began the study of medicine at the University of Virginia, and com-



EMMET COOPER DENT, M.D.

pleted his course at the Bellevue Hospital Medical College in New York in 1879. His life work was the study of insanity and the care and treatment of the insane, and for this unfortunate class he sacrificed every personal interest and ambition. In January, 1879, he was appointed assistant physi-

cian on the medical staff of the New York City Lunatic Asylum on Blackwell's Island by the Commissioners of Public Charities. He was promoted to the office of assistant medical superintendent in December, 1882, and was appointed medical superintendent in December, 1886. On December 8, 1886, he married Anna Lane Scott, of Mississippi. She and two daughters remain.

In February, 1896, when the New York City asylums were reorganized and placed under State care, Dr. Dent, with his hospital, was transferred to Ward's Island, where he served as superintendent of the female department of the Manhattan State Hospital. On June 1, 1905, the two departments were consolidated, and he was made superintendent and treasurer of the entire hospital as it now exists, the largest and most modern of its kind in existence.

To Dr. Dent is due the credit of many advances and ideas in the care and treatment of the insane. He was noted at home and abroad as being the first to introduce and develop hydrotherapy as a means of treatment, almost to the entire exclusion of medicines; the introduction of camp life for the acute insane; the use of music and of special diversions and amusements; advanced surgical care and treatment, and of operative procedures, especially on the female insane. He was the author of numerous articles on insanity. His hospital was the first to accept the more modern views in psychiatry, and has made further advance in this feature in the way of systematic investigation in detail and in the clerical study, he, personally, giving clinical lectures on the various types and manifestations of insanity and organizing his staff of thirty physicians into a society for the advanced study of psychiatry. Nothing of promise toward the interest of the hospital escaped his attention, and he was even keen and alert for the welfare of the five thousand unfortunates under his watchful care.

The members of the Council of the American Medico-Psychological Association held a meeting at the Hotel Astor, New York City, on Tuesday, January 16th, 1906, at which meeting they appointed, by formal resolution, a committee of three members of the Association, consisting of Dr. Wm. Austin Macy, Dr. George A. Smith and Dr. Charles W. Pilgrim, to draw resolutions expressive of the loss of their late fellow member and the late secretary of the Association, Dr. Emmet Cooper Dent.

The Council further directed by resolution that the said committee cause a copy of the resolutions prepared by them to be forwarded to the immediate family of Dr. Dent, and that the said resolution also be spread on the minutes of the Association, and other copies be forwarded at once to the principal medical journals.

The special committee appointed by the Council have prepared the following resolutions:

WHEREAS, By the death of our late associate, fellow member and secretary, this Association has been deprived of one of its most worthy members and progressive workers; and,

WHEREAS, We, his associates, have lost a dearly loved comrade whom we honored for his integrity, uprightness of character and sterling worth, whom we respected for his well-known high standards in professional and in ordinary living, whom we admired for his unselfish devotion to all that made for a higher manhood, and for his steady and unflagging interest in the suffering humanity to which he ministered, and whom we all loved as an ever loyal friend and companion; therefore be it

Resolved, That we extend to the bereaved family our heartfelt sympathy in their grief and the assurance that his memory will ever remain cherished by us.

(Signed)	WM. AUSTIN MACY,
(")	GEORGE A. SMITH,
(")	CHARLES W. PILGRIM,

THE
Journal
OF
Nervous and Mental Disease

Original Articles

THYROID METASTASIS TO THE SPINE.*

BY F. X. DERCUM, M.D.,
OF PHILADELPHIA,

PROFESSOR OF NERVOUS AND MENTAL DISEASE, JEFFERSON MEDICAL COLLEGE;
NEUROLOGIST TO THE PHILADELPHIA GENERAL HOSPITAL.

The following case, which is unique in my experience, has to do with the question of thyroid metastasis.

F. R.; female; white; widow; age 56; a Russian Jewess and a tailoress by occupation, was admitted to the Nervous Wards of the Philadelphia Hospital, June 17th, 1904.

Family history: Father died of cause unknown. Mother died of old age. Had eight sisters all of whom are dead but none of whom suffered from any affection similar to her own.

Personal history: Had the ordinary diseases of childhood but subsequently was well until the onset of the present trouble. Gave birth to nine apparently healthy children. Suffered occasionally from rheumatism which she attributed to her working in a damp basement. For some years she had suffered from a goitre. This gradually became so large that she sought relief at the University Hospital about six years ago. Here she was operated upon by Dr. A. C. Wood, the thyroid being successfully removed and the patient making a good recovery. Dr. A. C. Wood kindly supplied me with a copy of the entry in the admission book at the University Hospital relating to her case. It reads as follows:

"F. R.; aged 50 years, born in Russia, tailoress; admitted Au-

*Read at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.

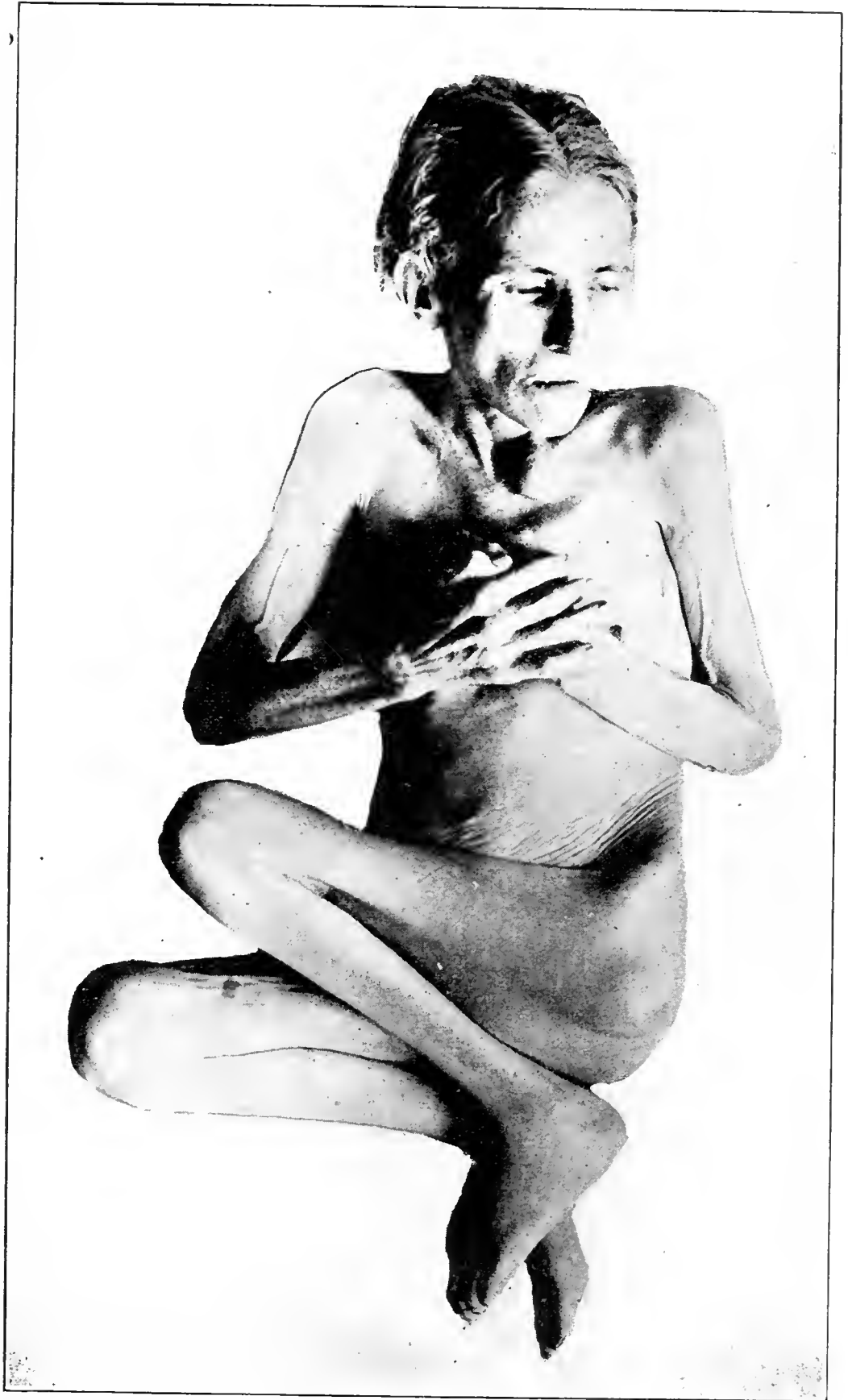
August 15th, 1899. Diagnosis, goitre; removal by operation; recovery. Discharged September 4th, 1899."

Dr. Eugene Lindauer, who was associated with Dr. Wood in the operation and subsequent care of the case, writes me concerning her as follows:

"At the time of admission, she was unable to speak above a whisper and that gave her considerable labor. Her breathing was very dyspneic. The goitre was of the simple type, about equally enlarged in both lateral lobes. I recall that at macroscopic examination, it seemed in appearance like a normal thyroid; a great deal of yellow gelatinous material was seen to be lying in the follicles of the gland. The operation, which was under ether, passed off undisturbed and the union was primary. Her difficulty of speech and breathing, associated with the incomprehensible jargon and absence of relatives who knew anything concerning the growth, prevented a history from being taken. There were no nervous symptoms observable at any time of her stay at the University Hospital."

When admitted to the Philadelphia Hospital, the patient stated repeatedly that one year after the operation by Dr. Wood, pain, severe in character made its appearance in the left upper extremity, and that this was followed by a gradual and progressive wasting of the muscles. Later these pains became generally distributed throughout the body. They were sharp and shooting in character. About a year ago, the patient began to have very severe pains in the right hip. These pains extended into the right leg and were followed by a gradual contraction of this extremity. A few months later, a similar pain made its appearance in the left lower limb, and was likewise followed by a gradual and progressive contraction of this limb. Later still she also developed pain in the right upper extremity, together with a gradual and progressive wasting of the muscles.

Upon admission the following notes were made: The patient is a rather small, anemic, emaciated woman. Both legs are markedly contracted. The right thigh is flexed at right angles with the trunk; the right leg is flexed at right angles with the thigh; the foot is in a normal position, but the ankle joint permits of but little movement. Attempts to move the joints elicit pain. Very slight passive movements can be made at the right knee but with the expense of pain to the patient. Little or no move-



ment can be brought about at the hip. The left thigh is likewise much contracted, being completely flexed upon the body, the left leg being completely flexed upon the thigh, while the left ankle joint is in a condition similar to that of the right. Slight passive movements can be performed at the left hip and left knee joint but they give rise to pain. The right thigh is adducted and rests upon the left leg, just above the ankle. There are a number of ecchymoses on the left leg, over the lower part of the abdomen, over the left iliac spine and another on the right thigh, anteriorly just below Poupart's ligament. This latter area is tender to touch and swollen. There is a small gangrenous area on the right heel. The skin of the right leg is reddened where the right thigh presses upon it. Several areas of superficial ulceration are noted along the spinal column. An ecchymotic area is present to the left of the spinal column, three inches in diameter, just over the left floating ribs. Moving the patient in any manner causes marked evidences of pain. An examination of the spine reveals a marked kyphosis in the dorsal region.

Both upper extremities are markedly wasted. In the left arm, no movement of the wrist, fingers, elbow or shoulder can be performed. There is a partial ankylosis of the metacarpal phalangeal joints and the phalangeal joints. There is marked atrophy of the intrinsic muscles of the left hand and of all the muscles of the left forearm. The extensors and flexors are extremely atrophied. There is also atrophy of the triceps, biceps and of the deltoid. This atrophy, however, is not as marked as that observed in the forearm and hand. The sternal end of the clavicle appears to be displaced, and above the clavicle a scar is observed which the patient states is the result of the operation for the removal of the thyroid gland. The right arm has suffered less than the left arm, although its muscles are much atrophied and there is a similar though less marked fixation of the joints.

The tendon reactions of the left arm are much increased. There is also a marked increase in the myotatic irritability of the muscles of the left arm, especially in the biceps and triceps. There are no fibrillary tremors. The tendon reactions of the right forearm appear to be normal. Possibly there is a slight increase of myotatic irritability.

The knee jerks cannot at this examination be elicited. There is no ankle clonus but a marked Achilles' jerk is present upon the

right side. Upon the left side no reaction can be obtained, possibly due to fixation. The plantar reflexes are active on both sides. The great toe is slightly flexed on both sides. The right hip joint and right knee joint appear to be enlarged. The left hip and left knee joint do not appear to be enlarged. The skin is somewhat smooth and shiny over the left hand and over the right hip and right knee joint. There is no tenderness over any of the nerve trunks.

The muscles of the right arm respond well to the faradic current, as do also the muscles of the left arm. The intrinsic muscles of the left hand do not respond. There is no response likewise in the muscles of either lower extremity, nor of either gluteal region.

There is no paralysis of the cranial nerves. The pupils are equal. Tactile and pain sensations appear to be normal except that on the left thigh the patient calls hot, cold. The sphincters are normal. The patient is mentally clear and bright.

On October 24th of the same year, she was again carefully examined. As before it was noted that the patient is an emaciated pale woman, very senile in appearance. She lies upon the back, slightly inclined to the left, with both legs drawn up, the thighs flexed upon the pelvis and the legs on the thighs. The flexion is extreme on the left side and marked on the right. The right knee is crossed over the middle of the leg of the left side, while the left foot is drawn over the vulva. The vertebral column presents two prominences; one in the upper thoracic and another in the lower lumbar region. The left clavicle presents at its sternal end an enlargement, rounded in shape and semi-solid to touch. It is about the size of a guinea egg. The thorax does not present any deformity.

The lower extremities are in a state of contracture, and any attempt at extension provokes pain. No voluntary movements are possible. The knee jerks can be obtained with great difficulty. There is no ankle clonus on either side. A distinct Babinski is, at this examination, obtained upon the right side. The muscular atrophy is exceedingly marked in both lower extremities, more pronounced upon the left side. The gluteal regions are also markedly wasted.

In the arms the atrophy is extreme, especially in the small muscles of the hands. These changes are as before more marked

upon the left side than on the right. The fingers of the left hand are in a state of semi-extension and are fixed in position. The fingers of the right hand are still movable and the right hand can be closed. The muscles of the forearms, the arms and shoulder girdle are markedly wasted. The pectorales are also wasted. The trapezii have likewise suffered, though they are better preserved, as the patient can still shrug the shoulders fairly well. The patient can move herself slightly from side to side, but there is at no time any change in the position of the legs. The muscles of the face appear also to have suffered. Wasting is apparently present and more marked on the right side than on the left.

As regards sensation, it is noticed at this examination that there is an analgesia over the right lower extremity. Over the left lower extremity there is a hypalgesia with the exception of a few areas here and there. Over the trunk, anteriorly and posteriorly, that is over the thorax and abdomen and over the entire back, the pain sense is abolished. In the right lower extremity the temperature sense is likewise lost. This is also the case over the entire trunk, abdomen and thorax and back. In the upper extremities, the temperature sense is normal. It is also normal over the face.

Trophic changes are noted as follows: An ulceration on the inner side of the right heel, on the right big toe, on the prominences over the spine and over the external angle of the left eyebrow. On the right side the ilium is noted to be markedly thickened. The same condition is noted in the left trochanter. The knee joints are now both enlarged, the right more than the left.

Carefully made skiagraphs of the contracted knee joints failed to reveal any osseous change. However, a skiagraph of the left clavicle presented the shadow of a mass in which the sternal end of the clavicle, as well as the adjacent portion of the sternum were imbedded. This mass corresponded to the tumor already mentioned.

On November 7th, an eye examination was made by Dr. Shumway. The pupils were contracted 1.5 m.m. They responded promptly. The movements of the extra-ocular muscles were good. The eye grounds were entirely normal.

On November 21st, the patient suddenly developed a high temperature together with a very bad diarrhea. This diarrhea,

together with a variable temperature, persisted, and on November 23rd, marked increase of the rate of respiration and dulness over the right lung posteriorly made their appearance. The patient subsequently appeared to make a recovery from this condition. On the 8th of the following February, however, there was another sudden rise in temperature. Her face was at first flushed and subsequently became very pale. Her pulse was regular, full and bounding. No râles were heard upon the left side, but a few crepitant râles were discovered upon the right side. At the apex, a loud systolic murmur made its appearance, and at the aortic cartilage there was a systolic and also a diastolic murmur. The patient grew rapidly much weaker. On the following day signs of edema of the lungs made their appearance, the pulse became very weak and the patient died.

An autopsy was made by Dr. Allen J. Smith, Pathologist of the Hospital, at which the following notes were made:

Body of a white female, about 57 years of age; extremely emaciated; limbs so strongly drawn on the abdomen that it is impossible to state height; weighing between 75 and 85 pounds; hair gray, slight hairy development on upper lip; body and pubic hair scantily developed. Eyes gray, pupils unequal, right 4 m.m., left 3 m.m. in diameter; teeth of upper jaw mostly gone; post-mortem rigidity absent. Post-mortem lividity poorly marked; no edema; marks of bed-sores on left and right hips, excoriation on upper portion of right thigh on internal surface; old leg ulcer on inner surface of right tibia just above the malleolus; no other important marks. The left thigh is especially flexed on abdomen; the right a little less; legs are flexed upon the thighs; both thigh and knee joints are fixed; both arms and limbs show extreme emaciation. The left sternoclavicular joint produces beneath the skin a rounded eminence about 1.5 inches in diameter and 0.75 inches in height; consistency soft and gelatinous.

Preliminary Incision: Adipose tissue practically absent; abdominal and chest muscles extremely thin, but of normal color, rather soft in consistence; considerable bleeding from veins, dark fluid blood.

Abdomen: On inspection of the abdominal cavity, the exposed peritoneal surface is moist and glistening throughout; no peritoneal adhesions. Omentum is thin, greenish-yellow, marked with distended veins and extends well down over the intestines. Liver

in the nipple line extends to costal margin, body of the liver extends more to the left than usual; slight gastropsis, reaching one-half inch below the umbilicus (lower border). Uterus slightly retro-flexed, partly distended with fluid. In the pelvic cavity, there are 25 or 50 c.c. of straw colored fluid.

Spleen: Weighs 150 g.; measures 11 x 8 x 2.5 cm.; roughly triangular in shape; non-adherent; capsule smooth, not thickened; of a light slate color; soft and flabby in consistence; cuts with slight resistance; cut surface dry and retracting a little; light red in color; trabeculæ rather prominent; Malpighian bodies fairly visible; splenic artery somewhat stiffened and stands open. Adherent to the vessels at the hilum is a small calcareous nodule 2 m.m. in diameter.

Stomach: Of normal size and shape; external surface normal throughout; walls uniform and thin throughout; internal surface smooth and towards the ends of the stomach there are a number of points of submucous hemorrhage and distended veins; no rugæ; no ulcerations; mucus, thick and viscid covers the surface; contents are brownish, viscid substance with black "coffee ground" altered blood.

Small Intestine: Normal externally and internally save for a little injection of its vessels, with points of petechial hemorrhage in lower six or eight inches of ileum.

Large Intestine: Appendix is externally normal; 10 cm. in length; 5 mm. in thickness; is provided with full mesoappendix and runs upward behind the ileum; internally normal. Externally, the large gut is normal; is of a rather narrow lumen especially in the transverse gut (colon); wall is not unduly thick in any part, mucous membrane in the cecal region is the seat of petechial hemorrhage; also in the descending colon and sigmoid flexure the veins are congested, mucous membrane pigmented and caseous.

Liver: Weighs 1240 g.; measures 20 x 15 x 7 cm.; organ is non-adherent; capsule smooth and of normal thickness throughout; margins of gall bladder thinned out from pressure; organ is of a black purplish color, firmer than normal; cuts with slight increase of resistance; cut surface granular, dry; lobules distinctly outlined with dark red centres.

Gall bladder is of ordinary size; filled with thin, greenish fluid; cystic and common ducts open.

Pancreas: Weighs 90 g.; measures 23 cm. in length, slender;

externally normal; appearance of cut surface normal; cuts with resistance.

Mesenteric Glands: Slightly enlarged; fleshy in consistence; cut with resistance; internal surface red and fleshy.

Left Kidney: Weighs 170 g.; measures 12.5 x 5.5 x 3.5 cm.; organ is slightly enlarged; normal shape and consistency; light red in color; cuts with slight resistance; capsule removes easily, but tears the renal substance, leaving a smooth, light red surface without any superficial injection of vessels; cut surface uniformly light red in color; cortex measures from 6 to 8 mm. in thickness; towards the tips of the pyramids there is a small streaky uratic deposit. Pelvis and ureter normal.

Right Kidney: Weighs 170 g.; measures 12 x 5.5 x 3.5 cm.; externally and internally is like its fellow, save that the subcapsular surface is more granular; a few cysts. Pelvis and ureter normal.

Bladder: Is distended with clear urine; shows no abnormal appearance either externally or internally.

Uterus and Ovaries: Present no abnormal lesions; uterine wall thicker than usual and spongy; ovaries small, shrunken; no abnormal lesions.

Thorax: On opening, the thickening of the sternoclavicular joint above mentioned was removed and on section was light red in color and fleshy in consistence, on the deeper surface somewhat gelatinous; the head of the clavicle is widened or puffed out as if to accommodate the growth.

On opening the chest, a few old, firm adhesions are found laterally and at the apex on left side; on the right side firm adhesions laterally and posteriorly. In the upper two thirds, involving the third and fourth ribs, is a tumor growth, 10 cm. in length, with the rib 5.5 cm. in width and 3.5 cm. in thickness; the rib is involved in this growth and is destroyed by the growth; tumor is covered by the pleura within and externally by the remaining intercostal muscles; apparently encapsulated; on section is light red in color; translucent; surface is granular and contains grit and spicules. A similar tumor involves the eighth and ninth ribs on the same side (right). On the left side smaller ones were present on the first, fourth and sixth ribs. On the right side of the vertebral column there is a small growth of the same kind, extending from the eighth and ninth vertebræ.

Left Lung: Weighs 300 g.; light gray in color; pleura smooth

save where adhesions existed; external pigment in perilobular positions; substance is crepitant throughout; at the apex is a firm nodular growth; posterior portion is slightly boggy; cut surface is light reddish-gray in dependent parts; fairly dry, but in dependent parts exuding a moderate amount of frothy fluid; at the apex there is one small encapsulated, slightly calcified nodule, but no other tubercular nodules.

Bronchial Glands: Are enlarged, black in color, firmer than normal in consistency; no calcification or tuberculous nodules.

Right Lung: Weighs 750 g.; surface where adherent, is roughened, organ dark reddish gray in color; lower lobe non-crepitant, fleshy upper lobe faintly crepitant; middle lobe moderately crepitant, but boggy. Lung cuts with fleshy resistance; cut surface is dark red in color; in upper and middle lobes exuding slightly bloody and frothy fluid; almost airless blood from the lower lobe, congested passively.

Cross section on bronchial tubes exude pus, especially in lower lobe; no trace of tuberculous change of any type. Bronchial walls rigid; mucous membrane deeply red; longitudinal bands prominent.

Heart: Weighs 280 g.; of normal shape; epicardium smooth throughout, with slight fatty deposit in the usual positions; wall of left ventricle 18 mm. in thickest part; right ventricle 6 mm.; muscular substance dark red, firm; endocardium of cavities normal throughout; aortic opening 25 mm. in diameter; pulmonary 26 mm.; mitral 30 mm.; tricuspid 35 mm. in diameter; leaflets of the right heart are normal; aortic leaflets practically normal; coronary vessels normal; all the cavities contain a small amount of stratified clot.

Aorta: Small atheromatous patch in the arch of the aorta, otherwise the ascending and descending aorta are free.

In the neck, attached to the trachea were several small tumors like those met with in the thorax.

Head: Scalp removed easily; of normal thickness and appearance; non-adherent over the tumor to be mentioned. Beneath the dura, penetrating the external table of the skull is a small, light red tumor of the same type as noted on ribs, between 1 and 2 cm. in width.

Skull is of normal thickness; diploic substance well marked; dura is non-adherent save to a slight degree about the longi-

tudinal suture; veins of pia moderately congested; basilar vessels normal.

Brain: Weighs 1245 g.; normal in appearance.

On cleaning the tissue along the spinous process for removal of the cord, two tumors like those already mentioned were found; the larger at the upper edge of the sacrum, the smaller involving the spinous process of the second lumbar vertebra.

Spinal Cord: On opening the canal and removing the cord, a tumor was found involving the fourth and fifth cervical vertebrae, pressing upon the cord and involving the dura mater; involving the second lumbar vertebra there was a smaller tumor without adhesions to the dura.

The cord and spinal tumor were submitted to microscopical examination.

The tumor, as above stated, involved the dura mater and pressed upon the cord; somewhat more upon the left side of the cord than upon the right. It extended from the lower third of the cervical enlargement downward a distance of about 7 cm. It was a hard mass, but gelatinous in consistency in its middle portion. It was somewhat wider in its middle portion than at its upper and lower parts. The bulk of the tumor was located more on the left side than on the right side of the cord. It was external to the dura, to which it was extremely adherent. The cord at the level of the tumor was much deformed and flattened.

The microscopical examination revealed the astonishing fact that the tumor was made up of thyroid tissue. All of the sections revealed the aveoli of the thyroid gland, some of them large and some of them medium sized; others very small. All of them revealed the typical structure of these aveoli lined by a single row of cubical epithelium and all were filled with the characteristic colloid material. The dura was much thickened and tracts of fibrous tissue can be seen leaving the dura and spreading among the acini.

The spinal cord revealed the following changes:

The section of the cervical cord immediately above the tumor revealed marked areas of degeneration involving almost the entire portion of Goll's columns, also to some extent adjacent portions of the columns of Burdach. The peripheral areas of the cord have also suffered considerably, especially is this true upon the left side. Here the direct cerebellar tract and Gowers'

column have undergone marked degeneration. Upon the right side peripheral degeneration is present though less marked than upon the left side, involving here only the direct cerebellar tract; Gowers' column appears to be but slightly involved, if it has not wholly escaped. Sections of higher levels of the cord again reveal extensive degeneration in the columns of Goll and also degenerative changes in the columns of Burdach, more especially upon the left side. Marked peripheral degeneration, that is of the direct cerebellar tract and Gowers' column are observed upon the left side. Upon the right side faint degeneration of the cerebellar tract is observed.

Sections taken from the level of the tumor reveal a marked deformity of the cord caused by compression of the left half of the cord in its posterior portion. This depression is most marked in the region of the posterior cornu. The entire left half of the cord is smaller than its fellow. The depression has evidently been caused by the tumor. Areas of degeneration are present in Burdach's columns. The fibres of Goll's columns appear to be unaltered. Very decided degeneration is present in both crossed pyramidal tracts. Similar degenerative change is noted in the left direct cerebellar tract and especially in the left Gowers' column. The direct pyramidal tracts also reveal degenerative change. Some of the posterior roots on the atrophied side are degenerated. The dura is also decidedly thickened; especially upon the atrophied side it is the seat of a marked round-celled infiltration. The pia arachnoid of the same side is also considerably thickened. Bundles of nerve roots are also seen surrounded with connective tissue. The blood vessels seem enlarged and the walls are the seat of nuclear infiltration.

Sections of the cord in the lumbar region reveal degenerative changes of both the pyramidal tracts and also some degeneration in the columns of Goll. The changes in the columns of Goll are evidently those of a descending degeneration as they are found entirely below the level of the lesion.

The microscopical findings are in accord with the motor and sensory changes noted during life. The contractures and atrophies are to be referred to the involvement of motor roots and to the extensive changes in the pyramidal tracts. The dissociated loss of sensation is exceedingly interesting and is no doubt to be referred to the involvement of Gowers' columns. This is

rendered the more probable by the fact that this loss was especially pronounced in the right leg, while it was the left Gowers' tract in which the most extensive destruction had occurred.

The above case opens up two questions: first, as to the possible metastasis of benign tumors, and secondly whether a thyroid tumor to become metastatic, must not necessarily be malignant. From observations made in recent years, it is evident that an ordinary goitre which has existed for a long time and which has never given rise to any symptoms suggesting malignancy may suddenly become widely diffused. By preference this metastasis takes place in the bones and in the lungs. In some patients secondary tumors of thyroid structure have been removed without any attention having been attracted clinically to the thyroid gland itself. Cohnheim, Lucke and Muller have described such cases. They were collected by Honsell¹, in 1899, in a paper on benign tumors giving rise to metastasis. Later Patel² observed in the service of Jaboulay, a remarkable case. The histological examination was made by Gayet and revealed unexpectedly a tumor of thyroid structure in a patient in whom a goitre existed but apparently was intact.

Patel has collected eighteen cases of thyroid metastases. The metastases were found especially in the bones, particularly the short and flat bones; for instance in the cranium, in the lower jaw, in the vertebral column, in the pelvis and lastly in the long bones. In the spinal column, the lesions begin, it would appear, in the spongy substance of the vertebra and subsequently spread into the arches; affecting the periosteum, the nerve roots and lastly the contents of the spinal canal. The process may go on to marked destruction of the vertebral bodies.

In the case here reported, thyroid metastases evidently occurred in various situations although that occurring in the spinal column was undoubtedly the cause of the nervous symptoms presented by the patient, if not the direct cause of her death.

Among the eighteen cases collected by Patel, there were four in which the spine had been either alone or especially in-

¹ Honsell. *Beitrage z. klin. Churug.*, XXIV, i.—*Semaine Médicale*, 1899, "Goitres bénins formant des métastases."

² Patel. "Tumeurs bénignes du corps thyroïde donnant des métastases," *Revue de Chirurgie*, 29, 1904, page 398.

volved. Two of these in a measure resemble the case here reported.

The first is a case reported by Gusenbauer³ in 1891. The patient was a woman who after suffering from violent generalized pains became paraplegic and presented a kypho-scoliosis of the lower thoracic vertebræ. An elastic non-fluctuating tumor was present upon the right side of the tenth and eleventh thoracic vertebræ. Simultaneously a large but benign goitre was present. The spinal tumor was extirpated and revealed upon microscopical examination, the typical structure of the thyroid gland.

The second case is that reported by Hollis⁴ in 1903. There was likewise present a paraplegia caused by multiple meningo-spinal neoplasms, having the thyroid gland structure. The patient was a man who first suffered from attacks of lumbago of variable intensity. Four or five of these attacks were very violent. He also suffered from severe headache and vomiting. He was admitted to the Sussex County Hospital on the 12th of December, 1901, and about one week later suffered from a paralysis of the left inferior extremity and subsequently of the right inferior extremity. A total paralysis rapidly supervened both motor and sensory; girdle pains also were present. Incontinence became established, a large bed-sore made its appearance upon the sacrum and the knee-jerks were abolished. The temperature was normal. Later it was normal and even subnormal. The patient remained in this condition for a month. His bladder was washed out and his headaches were treated with phenacetin. The vertebral column, repeatedly examined, failed to reveal any sensitive point. The girdle pains persisted. Later a deep pain made its appearance between the shoulders, together with a marked dyspnea. Some months later, there was edema of the left leg. Finally a tumor made its appearance deeply situated back of the left clavicle and the sterno-mastoid muscle. This tumor increased in size and a hard indented mass could be felt back of the anterior border of the muscle. Subsequently the tumor diminished and only two small glandular masses could be detected. A contracture of the back of the neck and of the right arm established itself. The patient finally died almost asphyxiated on the 11th of April.

³ Cited by Patel.

⁴ Hollis. *The Lancet*, March 28, 1903, p. 884.

At the autopsy, a tumor was found involving the membranes of the brain posteriorly and to the left of the falx. The brain substance of the external perpendicular fissure was involved. On the left of the cerebellum, a similar tumor was found. On the anterior surface of the body of the third dorsal vertebra, there was found a tumor which invaded and contracted the spinal canal. The spinal cord was entirely degenerated at this level. The thyroid gland in this case was not augmented in volume. There was nothing abnormal in the thorax. Two little tumors were found in the liver. The two suprarenal capsules were hypertrophied.

The microscopical examination of the tumors in the cerebellum, falx and suprarenal capsules revealed an identical structure; that is, numerous spaces and cystic cavities lined with epithelium and filled with colloid material. The structure was essentially a thyroid structure and the case is especially remarkable for the fact that there was at no time any increase in volume of the thyroid gland itself and for the further fact that nothing in the patient's symptoms had attracted any attention to the thyroid gland during life.

The question as to the malignant character of the enlargement of the thyroid gland in cases of metastasis, is one that cannot be regarded as settled. However, it is very suggestive that among the eighteen cases collected by Patel, thirteen were regarded as benign by the authors reporting them. In the remaining five, the benign or malignant tumor of the thyroid enlargement is not mentioned. In the present state of our knowledge, the problem can only be answered in a speculative way. It appears that simple hypertrophy plays no rôle in the etiology of thyroid metastasis. Patel calls attention to the interesting fact that it is particularly the colloid goitres in which metastasis occurs. They especially present diffuse cellular proliferation and it is readily comprehensible how under such circumstances metastasis could occur. Further goitres that are decidedly cystic present also vegetations in their interior and these may break down. That fragments should thus find their way into veins and capillaries, does not seem strange. Still it is remarkable, inasmuch as colloid goitres are relatively common, that thyroid metastasis does not occur more frequently. Wolfer maintains that if a metastatic growth not only increases in size, but

also takes on a destructive action upon the bone, the primary tumors cannot be considered as benign, not even when clinical, anatomical or even histological investigations have failed to establish their malignant character. Metastasis having once established itself, it can readily be understood how the occurrence of the new growth may at times be benign and at times malignant. Indeed it is not inconceivable that in cases in which there is a multiple metastasis, that some of the new formations may vary as regards this quality. Some may present benign and other malignant characteristics. As Patel points out, if the metastasis be benign, we will observe the typical structure of the thyroid gland. The vesicles will present some regularity as regards volume and arrangement. They will contain colloid material and will be lined by regular cubical epithelium with well-defined nuclei. If, on the other hand, the metastatic formation be malignant, we will probably find side by side with normal thyroid vesicles, areas in which are found irregularly shaped cavities crowded with epithelial cells of the same type as those which line the vesicles, but irregularly arranged, heaped in rows of disordered accumulations. This very absence of regularity would suggest malignancy. In the tumor of the case here presented, the alveoli are singularly normal in their appearance and malignancy appears to be absent. Whether this was the case in the other metastatic tumors observed in the general autopsy, was unfortunately not determined as only the spinal tumor was preserved. That pure and absolutely benign metastatic growths are possible, is extremely probable. Further, it follows that such metastatic growths exert, in the economy, a function similar or identical with that of thyroid tissue in its normal position.

SARCOMA OF THE CEREBELLUM; SARCOMATOUS INFILTRATION OF THE SPINAL PIA.¹

BY F. X. DERCUM, M.D.,
OF PHILADELPHIA.

PROFESSOR OF NERVOUS AND MENTAL DISEASE, JEFFERSON MEDICAL COLLEGE;
NEUROLOGIST TO THE PHILADELPHIA GENERAL HOSPITAL.

The following case is of interest both because of the symptoms noted during life, as well as the post-mortem findings.

G. D.; male; white; Italian; aged 17; by occupation tailor. Was admitted to the nervous wards of the Philadelphia Hospital, November 2nd, 1903, complaining of inability to walk well and of pain in the head and abdomen.

Family history: Father and mother living and well; three sisters also living and well. All are in Italy.

Personal history: Has had no previous disease to his knowledge. No venereal or alcoholic history.

For three months has complained of morning headache, which still continues. At times also he would stagger.

Present Condition: The patient is a small, thin, Italian boy. An examination reveals the Romberg sign and a distinctly ataxic gait. There is also considerable tenderness on pressure over the nerve trunks and the patient also complains of shooting pains extending down the legs. There is no wrist or foot drop. There is no difficulty of micturition nor any involvement of the sphincters. He states through the interpreter that he has occasionally fallen from weakness of the legs.

The grip is equal and normal on both sides. There is no ataxia of the upper extremities. The knee jerks are much diminished; especially the left. The elbow jerks are normal. Ankle clonus and plantar reflexes can not be elicited.

Sensation is everywhere normal except over the left lower extremity where there is some hyperesthesia. The pupils are equal and react to light and accommodation, though the left seems sluggish. An ophthalmoscopic examination by Dr. de

¹Read by title at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.

Schweinitz reveals in the right eye an optic neuritis with a swelling of five dioptries. In the left eye an optic neuritis, five dioptries is also noted. There is intense injection of the disc.

The general visceral examination is negative.

The patient was re-examined subsequently at intervals, the previous findings being confirmed.

November 12, 1903. Declared that his headache was frontal and not continuous.

November 14, 1903. Is much weaker; holds his head somewhat fixedly; chin toward left shoulder and somewhat lowered. There is a tendency while walking to fall toward the left side.

November 16, 1903. Patient to-day is much brighter and clearer mentally. He is, however, unable to turn his head save slightly from side to side, owing to severe pain in the back of the neck. The pain in head is now somewhat less and is referred both to the brow and to the occiput. It is now accompanied by nausea. Pressure over the various regions of the head fails to elicit pain, but pressure over the spine elicits tenderness, as low down as the twelfth dorsal vertebra, where it abruptly ceases.

The right pupil reacts promptly to light, while the left is quite sluggish.

November 21, 1903. Patient now presents a right-sided facial palsy, not marked, but revealed when the effort is made to show the teeth. There is also some impairment of hearing on the right side. In addition there is some hypesthesia of the right side of the face, the sclera and cornea included.

November 23, 1903. General condition is about the same, save that he is somewhat somnolent. Headache is much worse. The slightest effort greatly increases his suffering.

An exploratory operation had been repeatedly advised and the patient finally gave his consent. It was hoped even if no tumor could be found, that trephining by diminishing intracranial pressure, would mitigate his suffering. Accordingly an operation was undertaken by Dr. W. Joseph Hearn on the following day, November 24th. A large trephine opening was made over the right hemisphere of the cerebellum. The dura was very tense and when it was incised, the cerebellum bulged decidedly through the trephine opening. An examination failed to reveal any tumor. The edges of the dura were approximated and the wound in the scalp closed. The patient suffered greatly from shock, be-

came steadily weaker and did not recover consciousness. He died some eight hours after the operation.

An autopsy was performed the following day. The general visceral examination revealed nothing of moment, save a general enlargement of the mesenteric glands. The membranes of the brain, however, were thickened and much injected. At the site of the operation, there was some ecchymosis and hemorrhagic infiltration of the cerebellum. The cord seemed somewhat firmer to touch than normal.

A microscopical examination was made by Dr. William G. Spiller with the following result:

A tumor, friable in appearance, fills up and is confined to the fourth ventricle. It has pressed upon and atrophied the surrounding brain tissue, but is separable from these parts. Under the microscope, the tumor appears as a round cell sarcoma in certain areas, but in other parts many spindle cells are found, so that the growth may be regarded as a mixed sarcoma.

Sections from the cervical region show sarcomatous infiltration of the pia, especially over the posterior part of the cord. The infiltrating cells are small and round. The blood vessels in the infiltrated part of the pia are much congested. Round and spindle cells are found about some of the blood vessels within the white matter of the cord and also in one of the posterior horns, showing a tendency to sarcomatous formation within the cord. In general, the sarcomatous process is confined to the pia, and invades the cord substance very slightly from the pia. The nerve cells of the anterior horns are normal. Sections stained by the Marchi method show a slight recent degeneration in the posterior columns. No degeneration can be seen in sections stained by the Weigert hematoxylin method, and both posterior and anterior roots stain well.

Sections from the midthoracic region show similar sarcomatous infiltration of the pia, most pronounced over the posterior columns, but not confined to this part. The Weigert hematoxylin sections show no degeneration.

Sections from the lumbar region show sarcomatous infiltration of the posterior part of the pia. The nerve cells of the anterior horns are normal. The posterior roots by the Weigert hematoxylin method do not stain as deeply as the anterior, but no degeneration is found within the cord. Sections stained by the Marchi

method show recent degeneration within the posterior columns and posterior root fibres entering the cord. Sections of various peripheral nerves of the lower extremities failed to reveal any changes.

The ataxia and other cerebellar symptoms presented by the patient were, of course, accounted for by the presence of the tumor. The shooting pains of which the patient complained so markedly and which were clinically somewhat disconcerting were explained by the infiltration of the pia and the possible involvement of nerve roots. The tenderness of the nerve trunks, so suggestive of neuritis, was not, however, found to be associated with any organic change, the nerve trunks being, as already stated, entirely normal.

A CASE OF BROWN-SEQUARD PARALYSIS, DUE TO A FALL
UPON THE HEAD; OPERATION; AUTOPSY.¹

BY WILLIAM C. KRAUSS, M.D.,

OF BUFFALO, N. Y.

Cases of Brown-Séquard paralysis are not so frequent but that individual cases may be reported, thus adding to our knowledge of the causation of this peculiar affection, with a view of stimulating research along therapeutic lines.

The following case which was observed in the Buffalo General Hospital, offers some features not commonly met with in the study and observation of these interesting conditions. It is the first case observed at the hospital and naturally led to some speculation as to its identity, as the early part of the clinical history will show.

C. H., colored, age twenty-two, male, born in the United States. Height, 5 feet, 7 inches; weight, 140 pounds. Occupation stable-boy, following the races, and was employed in this capacity at Fort Erie, Canada, opposite Buffalo, when the accident occurred.

Family History: Negative; had the grippe when fifteen years old, and typhoid fever when ten years old. On the evening of July 7th, 1904, he fell from a hayloft, a distance of twenty feet and struck on his head. The hospital reports are now given verbatim: He was unconscious and did not come to until his arrival at the hospital, an interval of perhaps one hour. He says he slept all the way.

On entering he complains of a very sore neck, the muscles of the back of the neck being very painful, also complains of pain in the left arm and leg, neither of which he could move. He says his head was not injured as he felt no pain anywhere there. The back of the neck, however, was painful, especially over the fourth and fifth cervical vertebræ and on attempting to move the head he would cry out with pain. The same pain was also provoked on moving the left arm or leg. Examination made by a member of the house staff on the evening of his entrance revealed the following condition: There is present no fracture or dislocation. General muscular soreness is present, especially on moving

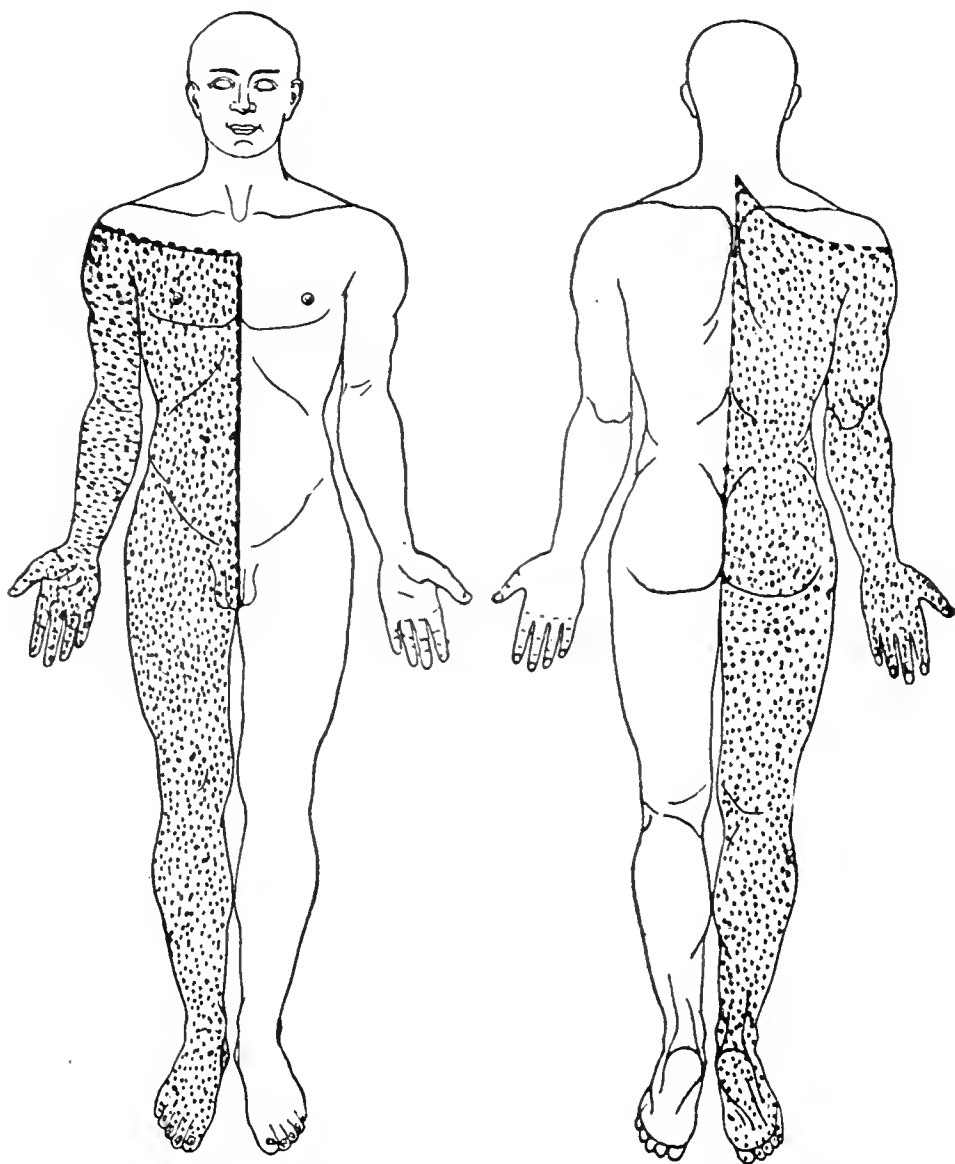
¹Read at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.

the head. There is a slight laceration over the right ear, otherwise no contusion or abrasion of the skin could be found.

Heart and lungs are normal, likewise the abdominal organs. Patient cannot move left arm or leg.

July 10.—Patient much improved, still cannot move left arm or leg. Sensation of same is present.

July 17.—Paralysis is seemingly still present in the left arm,



Sensory Involvement.

Sensory Involvement.

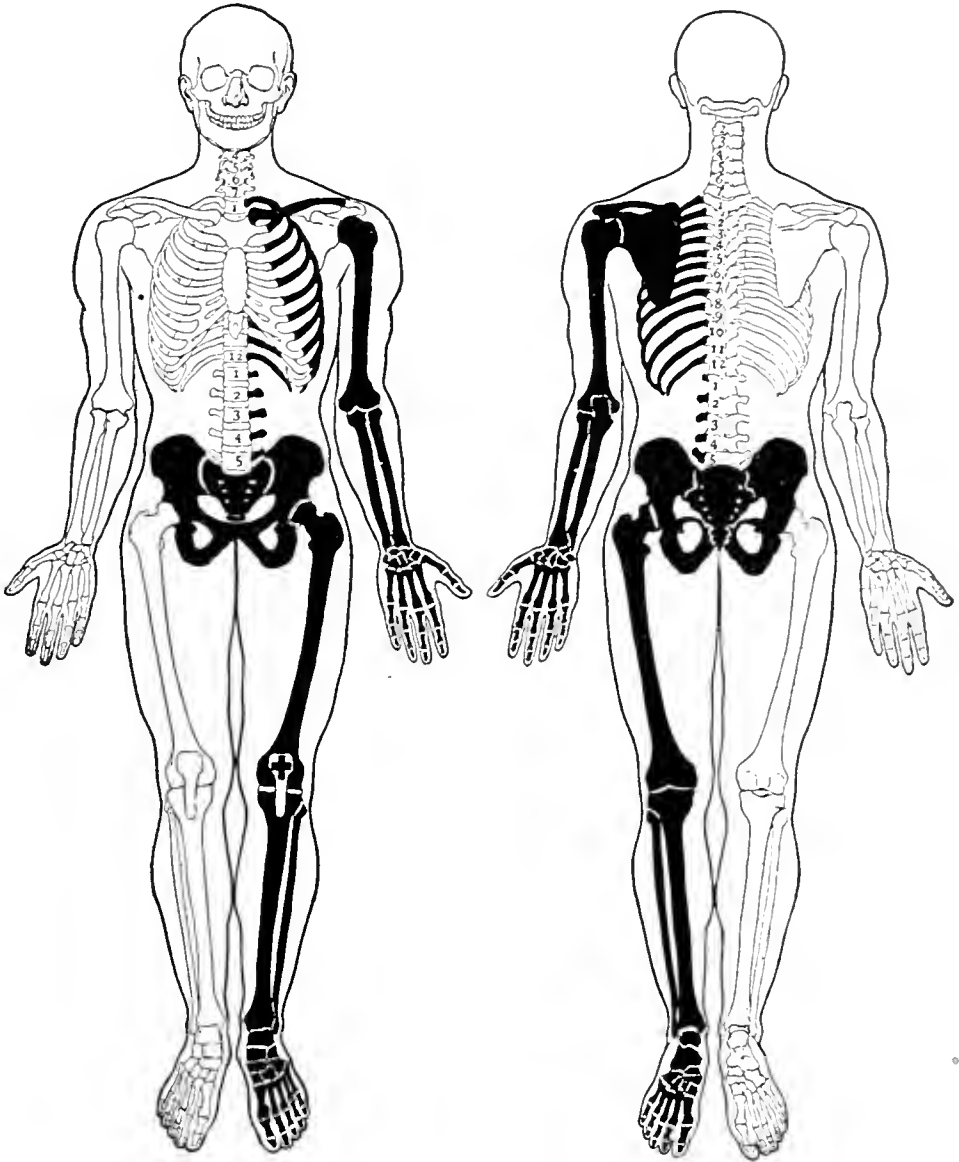
and the arm is used with difficulty, but still improving; the left leg can be used somewhat.

July 19.—Patient made to get out of bed. The paralysis believed to be a fake. The supposed paralyzed parts improving.

July 22.—Very marked improvement in above conditions.

On July 26, 1904, I was asked to see the patient with a view

of suggesting something to hasten his improvement and his discharge from the hospital. I found him in the general ward with head somewhat retracted and stiffened. His expression was that of one suffering pain. The eyes, pupils and ocular muscles were normal in their movements. No asymmetry of the face and no deviation of the tongue. Hearing was normal and he gave no history of otorrhea. Percussion of head was not painful and no



Motor Involvement.

Motor Involvement.

scars could be found. The back of the neck over the fourth and fifth cervical vertebræ was exceedingly painful and he resisted movement of the head. It seemed as if the soft parts were slightly swollen over this region and it was almost possible to detect crepitus at times. The sensation of the face and neck was unimpaired.

Ventral aspect—Right side: Sensation is interfered with, beginning at a level of about two inches below the clavicle and extending caudad—affecting the right arm, right half of trunk to the median line and right leg. Anesthesia complete, with analgesia, thermo-anesthesia are present, extending over this area. Motion of the right arm, right leg and right side of the chest are not impaired. The muscle reflexes, tendon reflexes, and abdominal reflex are active and normal.

Left side: Sensation: There is no impairment of sensation, except a hyperesthesia limited to the whole of the left side—so severe that patient cries out when the skin is slightly touched. This hyperesthesia is referable to touch, temperature and pain.

Motion: The left arm is almost helpless, some slight motion is present about the shoulder joint, but the arm and hand muscles are powerless. The movements of the left side of the thorax are markedly diminished, the excursions of this side of the chest is in marked contrast to those of the opposite side. The left leg is totally paralyzed and on being asked to move it he cautiously raises it with the help of the right or anesthetic leg.

Reflexes: The muscle reflexes are all exaggerated. Biceps and triceps tendon reflexes are active. The patellar tendon reflex is exaggerated. Ankle-clonus and Babinski's reflex are present in the left foot. The abdominal reflex is active. Cremasteric was not noted. Patient passed urine and stools involuntarily. No priapism was noted. No trophic disturbances—as bedsores or callosities were present at this time.

Dorsal aspect: Right side: The level of impaired sensation was limited to a little below the cephalic border of the scapula, embracing the right arm, leg and trunk to the median line, otherwise the dorsal conditions coincided with those on the ventral aspect.

With the history of the case and the symptoms as described I did not hesitate to declare it a Brown-Séquard paralysis following an injury to the fourth cervical vertebra, and in all probability a splintering of the lamina of the left side of the arch of this vertebra, injuring the left side of the cord at this level. The diagnosis of the height was warranted by the localized tenderness and level of anesthesia, coupled with the extent of motor paralysis and respiratory involvement. Carefully watching the case for several days it became apparent that the respirations were growing more shallow and rapid although pulse and temperature remained practically normal.

Fearing that the phrenic and long thoracic or respiratory nerve of Bell were becoming exhausted I urged operation at once, and on July 29th, 1904, a laminectomy was performed by Doctor William C. Phelps, the surgeon in charge of the ward. The hospital notes read as follows:

Operation: "Incision extending from the first cervical to the

first thoracic vertebra. Exposure of the fourth and fifth cervical vertebræ. The lamina of the fourth was chiseled in two and removed with the spinous process. The cord was found on opening the dura to be considerably softened on the left side, and a great deal of cerebro-spinal fluid escaped; search for clot and depression was continued higher and spine of third vertebra removed. Wound was closed with catgut sutures—the dura with deep interrupted sutures."

Although the operation disclosed the softening or injury to the cord at the level of the fourth vertebra on the left side, it did not reveal the means by which this injury was inflicted, and in this respect was unsatisfactory. There was no fracture of the bodies of the vertebræ at the exposed region and no pressure upon the cord by blood clot or dislocated vertebræ. Following the operation there was an improvement in the respiration and the general condition was excellent. On August 2d, 1904, the first dressing and plaster of Paris collar removed. There was some discharge of cerebro-spinal fluid.

August 5.—Patient says that prick of pin is equally sharp on right and left arms and upper part of body. Condition of legs remains unchanged as regards sensation.

August 7.—Sensation still diminished on right side of body and right leg. Can move both arms to some extent. Wound nearly healed. Third dressing. General condition good and improving.

The change for the worse occurred during the night of August 7th, as the hospital notes again show.

August 28.—Patient is delirious and irrational at times. Right side of chest shows some dullness on percussion and rough breathing.

August 11.—Skin is becoming very harsh and dry. Emaciation is marked. Patient is rational and easily irritated. General condition is much poorer, and seems to be going down hill rapidly.

August 14.—Patient's condition is worse. Lies in semistupor most of time. Involuntary passage of feces and urine. Respirations are very shallow. First heart sound weakening.

August 16.—General condition very critical. Delirium and coma increased. Heart is weakening steadily. Can be only slightly roused.

August 19.—Gradually grew worse.

The above mentioned symptoms remaining unchanged until his death which occurred at 5.15 P. M.

During the last weeks of his illness bedsores had developed under the left elbow, sacrum and left heel and infection had undoubtedly taken place as temperature ranged from 103 to 105° F., pulse 110 to 130° and respirations from 30 to 50 per minute.

The autopsy was performed by Dr. Nelson G. Russell and the findings are as follows:

Nutrition: Little subcutaneous fat, atrophy on left side of body more marked than on the right.

There is present a scar over the cervical vertebræ.

Thorax: Lungs, *left*, normal appearance and consistency. Weight 16 ounces. *right*, lower lobe is firm, dark and has little consistency. Weight, 24 ounces.

Heart: normal.

Brain: Normal. Arteries not atheromatous.

Abdomen: not opened.

Spine: Compression of the spinal cord on both sides at the fourth and fifth cervical vertebræ by a spicule of bone, more apparent on the right side. The meninges are quite adherent to the vertebræ, also somewhat adherent to the spinal cord. No blood clot present and no dislocation. No gross destruction of the cord although for an inch or more it appeared softened and had a reddish grayish color. A small wedge-shape splinter about three-quarters of an inch long, with jagged edges, which was separated from the lamina of the right side of the fourth vertebra was displaced to the left and inward toward the cord, so that it pressed upon the dorsal surface of the cord about two-thirds of way across, and about one-third of left side of cord was not interfered with. The pressure of indentation was less than one-sixteenth inch in depth. The splinter was adherent to the dura and quite movable after the meninges were exposed. From the nature of the adhesions and the inflammatory conditions it is reasonable to infer that the splinter was dislodged at the time of the accident.

The cord was removed, hardened and stained by Pal and carmine methods but showed no distinct areas of secondary degeneration.

Little has been added to the brilliant observations of Brown-Séquard who first described the symptoms following a hemisection of the spinal cord in the year 1867, and the facts gleaned in the laboratory have been fortified by facts observed at the bedside. The sensory and motor paths of the cord can be nowhere better illustrated and defined than in a study of Brown-Séquard paralysis.

Turner, in *Brain*, 1891, collected and analyzed sixty cases of this affection reported up to that time, and since then I have been able to find sixty more cases.

Etiology: Stabwound, 16 cases; syphilitic meningo-myelitis, 13 cases; syphilitic embolism, 1 case; gumma, 1 case; hematomyelia, 8 cases; following tumors of the spinal cord, 7 cases; tubercular spondylitis, 4 cases; traumatic spondylitis, 1 case; solitary

tubercle of the spinal cord, 2 cases ; inflammatory process, 2 cases ; chronic myelitis, 1 case ; after laminectomy, 1 case.

Age: The oldest case was reported by Volkman in a man sixty-six years of age due to a glioma, the youngest by Hoffman in a boy sixteen years old, the result of a hematomyelia.

Sex: Of the fifty-one cases noted thirty-nine were males and twelve females. This is not surprising as this affection is par excellence one of the strenuous life. Of the twelve females, syphilitic meningo-myelitis was the cause of the lesion in 6, or 50 per cent.

The left side of the cord was the seat of the disease in twenty-nine out of forty-seven cases noted, the right side in eighteen cases.

The prognosis of a Brown-Séquard paralysis is not as unfavorable as one would imagine, as the etiology in fifty per cent. of all cases is due either to stabwound or syphilis, both of which are amenable to treatment. My statistics show seventy-five per cent. of recoveries.

That the operation did not reveal the cause of the injury was disappointing—but not surprising.

Schultze, of Bonn, has reported a case of spinal cord tumor of the cervical region, where a laminectomy was performed by Schede, and the tumor not found, while at the autopsy the suspected tumor was found at the seat of operation partially hidden by the exposed cord.

That the diagnosis was at first considered as hysteria by the house staff is not to be wondered at, as analogous manifestations have been observed in true hysteria. Thus Rosenthal has reported a case of hysteria presenting a hemi-paresis with exaggerated reflexes and hyperesthesia on the *left* side—sensory disturbances analgesia, anesthesia and thermoanesthesia, with normal reflexes on the right side. Although the causes of a Brown-Séquard syndrome are varied, I have not been able to find a similar case where a splinter of bone split off from the lamella of the vertebra, has hemisected the cord.

Thorburn,² in an interesting paper on cases of injury to the cervical region of the spinal cord, reported nine cases, four of which were hematomyelia, the other 5 either fracture or fracture-dislocation. In only one case was there external deformity, there being in none of the others the slightest local indication of the

² Brain, Vol. 9, 1886, page 510.

severe injury which had been sustained. The anatomical sequelæ following a lesion at the fourth cervical segment are interesting and help to localize the seat of trouble at this segment. Particularly is this applicable to the phrenic or internal respiratory nerve of Bell, and the posterior thoracic or external respiratory nerve of Bell. The phrenic arises chiefly from the fourth cervical nerve, with a few filaments from the third, and a communicating branch from the fifth. Passing under the neck muscles it enters the thorax, passes in front of the root of the lung to the diaphragm, where it divides into branches which separately pierce the muscle and are distributed to its under surface. There is a slight difference in the course of the right and left phrenic nerves, but the origin and distribution are the same. Injury to the right phrenic nerve at its origin, or cephalad to the fourth cervical nerve, will produce paralysis of the right side of the diaphragm, and a restriction of the pulmonary capacity on this side would be the result.

The posterior thoracic nerve arises sometimes from two roots—the fifth and sixth cervical but generally from three—the fifth, sixth and seventh nerves, and extends down along the side of the chest to the lower border of the serratus magnus muscle supplying branches to each of its digitations. There are also two of these nerves, right and left. Injury to the right posterior thoracic or to the spinal cord cephalad to the fifth cervical nerve, will produce paralysis of the right serratus magnus muscle, and a partial failure of the raising and everting of the ribs in the act of inspiration. There results then a marked difference between the excursions of the right and left sides of the thorax, as noted in the history of the case, and as a final result the development of a hypostatic pneumonia of the right lung, diagnosed at the bedside and verified in the morgue.

The left side of the chest and the left lung were not in any way involved.

The case described merits consideration because it is:

1. The only case reported of a lesion in one-half of the spinal cord—not due to stabwound, tumor, hemorrhage, dislocation or a syphilitic meningo-myelitis but to a splintering of the lamella without fracture of the body of the vertebra.

2. It is the only case so far reported where a laminectomy has

been performed at the seat of the injury with a view of removing the lesion.

3. The symptoms corresponded very clearly to the commonly accepted syndrome,—except that no narrow band of anesthesia was found cephalad to the hyperesthetic area. This region was tested very carefully several times.

A CASE OF ASCENDING UNILATERAL PARALYSIS.[†]

BY L. NEWMARK, M.D.

OF SAN FRANCISCO.

When I first saw the patient whose disease I am about to report, I thought the symptoms were caused by a cerebral focal lesion. This was the view taken also by two distinguished German neurologists whom the patient later went abroad to consult. Neither, however, seems to have considered this diagnosis as firmly established. The most salient feature of the clinical picture is the loss of power involving first the lower extremity of one side and then the upper, so that finally a hemiplegia has resulted. Dr. C. K. Mills² published in 1900 an account of a case of this kind, which he regarded as representing a new form of degenerative disease. Whatever interest may be excited by the novelty of this disease may, I think, be shared by the following observation:

In November, 1900, S. B., a young man, 23 years old, complained that for six months past his left leg had been growing weaker. He would trip often on rough pavements because he could not clear the ground well with the tip of the left foot. At times he could not use the left arm well, so that he occasionally was unable to manipulate his knife and fork properly. Such weakness of the left arm, however, would soon pass off, but he asserted that it might be brought on by exertion. There had been no syphilitic infection. He had been subject to headaches, generally frontal, a few years earlier, but they had become very infrequent. His general health was excellent.

The patient is about 5 feet 6 inches in height and weighs over 200 pounds. In unaffected parts his muscular development is Herculean. His condition from November 1900 to December 1901 was as follows: He has walked from the time I first saw him in a manner that suggested a foot-drop on the left side, not with the circumduction of the foot such as is seen in the ordinary hemiplegia of cerebral origin. He was able to perform all move-

[†]Read by title at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.

²JOURNAL OF NERVOUS AND MENTAL DIS., April, 1900.

ments in the knee and hip, but with less force than on the right side. Greater was the reduction of power at the ankle and in the toes: There was marked ankle-drop, dorsal flexion of the foot being very feeble, and except for some ability to extend the big toe the toes were almost completely paralyzed. The knee-jerk and heel-jerk were lively on both sides, but the left were much in excess of the right. At first there was only a brief indication of ankle-clonus on the left side, but by March 1901 a lively ankle-clonus was easily produced. No plantar reflex at all could be obtained in the left foot at any of the numerous examinations; from the right sole either a faint flexor response was elicited, or only a contraction of the tensor fasciae latae, or, on some occasions, no response at all. The cremasteric and abdominal reflexes were normal. The left lower extremity was flabby, not spastic, and exhibited a general wasting. The circumference of the left leg at a certain point was (in December, 1901,) $37\frac{1}{2}$, that of the right $39\frac{1}{2}$ cm. The circumference of the left thigh was at the same time to that of the right as $53\frac{1}{2}$ to 58.

The left upper extremity was also clearly thinner than the right. This was especially noticeable when the left contracted biceps was compared with its huge fellow on the other side. This difference between the two upper limbs was observed from the beginning of my acquaintance with the patient. In October, 1901, where the left forearm measured $24\frac{1}{2}$ cm. the right measured $26\frac{1}{2}$. Across the biceps brachii, when the forearm was extended, the left arm measured $29\frac{3}{4}$ cm. to $31\frac{3}{4}$ and across the contracted biceps the circumference of the left arm was 31 cm. to 34 on the unaffected side. Atrophy was also distinctly shown in the altered curve of the neck on the left and in the rounding of the left shoulder. In November, 1900, it was noted that the grasp of the left hand was quite good; a year later the power in the left upper extremity was still fair, although less than in the right. But the patient had full use of this limb. It is not recorded that he ever complained of any permanent impairment in it during this period. The supinator and triceps jerks were not at all exaggerated on either side; in fact they were rather feebler than normally, and there was no constant difference in this respect between the two upper extremities.

In the beginning of 1902 the patient went abroad to seek medical advice and returned in June 1903.

His left arm now hung limp, of no practical use. That is its present condition. The fingers are flexed, the hand is closed, and he is much annoyed by the thumb "always being caught." If the fingers be passively extended he can exert a very fair grip. At the wrist there is great weakness and the flexors have lost even more of their power than the extensors. Flexion of the elbow is feebly performed, but the power of extending it is remarkably well preserved, considering the weakness in the other movements of the upper extremity. The patient can hardly abduct the humerus, the arm dangles at his side. If the arm be passively elevated to the horizontal he cannot raise it higher or even hold it there. By raising the shoulder, drawing the arm back a little and then extending the forearm he is able to deliver a blow. He has power over the trapezius, but less than on the right side, and its atrophy is as conspicuous as that of the extremities on the left side. It cannot be said that the wasting has advanced any since 1901. There is no paresis in the facial muscles or in the masseter. The left half of the lower lip is thicker than the right. Indeed the lower part of the face is fuller on the left than on the right (unaffected) side. This is said to be congenital and to have been observed in three generations of the patient's family. When the upper and lower rows of teeth meet, the space between the two lower middle incisors is a little to the left of the upper one. The left lower extremity is not worse than in the first period of my observation; indeed the patient thinks he has more strength in the calf muscles. He is not able to produce any visible movement at the ankle or in the toes when he is lying on his back with the lower limb extended; if, however, I pull the foot down plantarward and then have him exert himself to bring it dorsalward action may be distinctly observed in the anterior tibial muscle. This action may also be perceived when he attempts dorsal flexion of the foot while crossing the left leg over the right knee. Flexion of the knee is weakened, but extension is still quite powerful, a condition analogous to what has been described in regard to the elbow. When the patient draws the left thigh up to the trunk while he is recumbent, he has to hold the thigh with his hand to prevent it from falling outward.

No inequality has been observed in the action of the abdominal muscles.

There is no tendency to contractures in the affected limbs.

Both knee-jerks are lively, the left distinctly exaggerated. Ankle-clonus can generally be elicited without difficulty on the left side. The plantar reflexes could usually not be obtained with certainty. But recently Oppenheim's method gave a flexor response in the smaller toes of the right foot and a distinct extensor response in the big toe of the left foot. Of late neither cremaster nor abdominal reflex has been obtained. The disappearance of the abdominal reflex may be explained by the flabbiness of the abdominal wall in consequence of the reduction of the paunch. The reflexes of the upper extremities contrast with those of the lower. They have not at any time been lively, some times they were rather hard to get at all. In February, 1903, it was noted that there was a distinct elbow-jerk on the left (the affected) side, while it could not be got with certainty on the right. A reflex could barely be excited by tapping the radius at its lower end, while it was plainly enough to be produced on the sound side. All the affected muscles react in a normal manner to faradic and galvanic currents.

There is no disturbance of sensation of any kind anywhere. Pupils, optic discs, bladder are normal. There is no nystagmus.

The characteristics of this case are the weakness befalling successively the lower and upper extremities of one side, the flaccidity of the paralysis associated in the lower limb with increase of the tendon reflexes and abnormality of the plantar reflex while in the upper limb there is no exaggeration of the reflexes and the uniform wasting in the affected extremities without alteration of the behavior of the muscles to the electric currents.

This succession in the progress of the paralysis, the increase of the reflexes without contracture or spasm, and the uniform wasting without change in the electrical excitability of the muscles were all noted in the case of Mills, the publication of which called attention to this form of disease.

Patrick's² description of the flaccidity in his patient, a girl 18 years old. "as shown by the dangling arm, foot-drop and moderate steppage," tallies with what my patient presents. This condition differs conspicuously from the spasticity of the extremities mentioned in Spiller's³ report of a case under the title of "Progressive Ascending Unilateral Paralysis" it contrasts also with the rigid-

¹ JOURN. OF NERVOUS AND MENTAL DIS., August, 1903.

² Ibid, Vol. 28, p. 36.

ity mentioned by Potts¹ in his paper on "A Case of Unilateral Ascending Paralysis, probably due to Multiple Sclerosis." There was no wasting and there was spasticity in the case reported by Mills and Spiller² of a triplegia which had developed out of a hemiplegia which itself was considered to have borne the essential features of the disease under discussion. From their account I do not get the impression that we are dealing with quite identical conditions.

The most extensive correspondence seems to me to exist between Patrick's case and mine. Besides the points of agreement already mentioned there is the inception of the disease at about the same period of life. But what distinguishes my patient from Patrick's and the others is the degree of paralysis to which the disease has progressed in the upper extremity and the feebleness of the reflexes in that part. This absence of exaggeration of the reflexes in the affected as well as in the sound upper extremity is a marked incongruity in the clinical picture.

The wasting which is common to Mills' first case, Patrick's, and mine is evidently an important characteristic of the disease.

It is not due to inactivity, for the lower limb is not inactive in any of these cases, and my patient exhibited the wasting in the upper extremity when he had still complete use of it.

On account of clinical differences one hesitates to apply the post mortem findings of Mills and Spiller to the present case. They found an uncomplicated degeneration of the direct and crossed pyramidal tracts. This degeneration would account for the increase of the reflexes in the lower extremities. According to Rothmann, who has made a critical survey of the facts bearing upon the subject, only the exaggeration of the reflexes, with clonus and the Babinski sign, may with certainty be considered as symptomatic of an affection of the motor tracts. If the degeneration of the pyramidal tracts sufficed to explain the spastic condition in the case of Mills and Spiller, something more, or less, would be required to explain the flaccidity in the other cases. Before, however, we attempt to refer the several symptoms to lesions of this or that structure we must confront the question whether we are dealing with a diffuse or a systemic or a focal disease. Potts saw such other symptoms associated with an ascend-

¹JOURNAL OF NERVOUS AND MENTAL DISEASES, Oct., 1901.

²Ibid. July, 1903.

ing unilateral rigid paralysis as to lead him to the assumption of multiple sclerosis. No basis for such an assumption is given in this instance. Nor has anything developed during more than four years of observation to prove the existence of a focal cerebral lesion. The impression grows on me that there is a systemic disease in the spinal cord perhaps involving cells in the anterior horns as well as motor tracts yet different from the ordinary type of amyotrophic lateral sclerosis.

DIFFUSE GLIOSIS OF THE CEREBRAL WHITE MATTER IN
A CHILD.

By W. N. BULLARD, M.D.,
OF BOSTON,

PHYSICIAN FOR DISEASES OF THE NERVOUS SYSTEM TO THE BOSTON CITY
HOSPITAL,

AND

E. E. SOUTHARD, M.D.,
OF BOSTON,

INSTRUCTOR IN NEUROPATHOLOGY, HARVARD UNIVERSITY MEDICAL SCHOOL, AND
SECOND ASSISTANT VISITING PATHOLOGIST, BOSTON CITY HOSPITAL.

[From the Pathological Laboratory of the Boston City Hospital.]

The case here reported was that of a child which, after a fall on the back of the head, gradually lost power to walk, grew deaf, dumb, blind, and stupid, and died twelve months after the fall. The autopsy showed a peculiar overgrowth of neuroglia, with some destructive properties, confined to the white matter of the posterior parts of the cerebrum, optic thalami, and areas in the white matter of the cerebellum.

I. CLINICAL HISTORY.

Dr. Bullard.

Edward J., six years old, born in Boston, was first seen January 16, 1904.

There was no history of inheritance. Parents were healthy. There were ten children, patient being the eighth. Of these five were dead, four of "stomach trouble" and one of "meningitis."

The patient had always been well up to the time of the present trouble, except for measles when three years old.

Present trouble: Six months ago while playing in the cellar he fell backward down three steps. He was not unconscious, but got up himself and came up stairs crying. He seems to have had some nose-bleed, and possibly bleeding from one ear. The night following he was feverish and restless, but not apparently delirious. The next day he seemed well, and went out to play as usual. He did, however, have nose-bleed whenever his face was washed.

Since the accident he has been "nervous," and for five months he has had some difficulty in walking, staggering so that he is obliged to put out his hands to steady himself. Has never fallen from this cause. Can use his knife and fork. Mother thinks he is becoming stupid. Frequency of micturition. Is very deaf and has been taken to the Eye and Ear Infirmary, where operation for adenoids was advised.

Physical examination: Same as before, but now he obeys no directions and does not appear to understand or notice what is going on about him. Cries when examined. Walks with very short steps swaying from side to side.

Dr. Holmes (Aural Department) reports: No aural signs to account for the deafness, which is apparently of nerve origin.

July 6. Dr. Williams (Eye Department) reports: Some atrophy of each optic nerve, but not enough to account for almost total lack of vision. The latter is presumably of cerebral origin.

July 13. Was admitted to the Hospital Second Surgical Service, Dr. Monks. Temperature normal. Pulse 100-120.

July 18. Operation. Dr. Monks. Trephined about $1\frac{1}{2}$ inch behind and 1 inch above right ear. Dura thickened. No visible cerebral pulsation. Dura opened. Pia slightly thickened, edematous. Several drachms of clear amber-colored fluid drawn from lateral ventricle.

July 20. Died.

II. ANATOMICAL FINDINGS.

Permission was granted to open the cranial cavity. The examination was made fifteen hours after death by Dr. R. L. Thompson, whom we wish to thank for his record. The child was 129 cm. long. Development fair. Nutrition good. Pupils equal, 5 mm. wide. Circumference of skull 53 cm. Frontal suture well marked. Surgical opening 1 cm. square in squamous portion of right temporal bone, 5 cm. above and behind external auditory meatus. Dura everywhere adherent to calvarium.

Brain with pia mater weighs 1.445 gms. Pia mater and vessels normal. Convolutions symmetrical. Substance very firm toward occiput. Ventricles contain a normal amount of fluid tinged with blood. Cruor clot, 2 cm. in diameter, in descending horn of right ventricle.

The white matter of the posterior part of the centrum semio-

vale in both hemispheres is replaced with grayish or straw-colored slightly translucent material of a dense consistence. The lesion is somewhat sharply limited to the white matter; the cortex, of a paler color, sinks below the surface of section. In the right occipital region there is a narrow layer of less dense white matter between cortex and lesion.

The areas of increased density were roughly marked out at autopsy. On the right the lesion involves and in part replaces the white matter of the occipital, parietal, and temporal lobes. The right optic thalamus is somewhat firmer than normal. In the left hemisphere the lesion is still more marked and almost everywhere replaces the white matter of the occipital, parietal and temporal lobes. The left optic thalamus is even firmer than the right. The lesion on the left side stretches at least 1 cm. anterior to a frontal plane taken just in front of optic thalamus. Pieces were removed for fixation in Zenker's fluid, and the rest of the brain was hardened in 10 per cent. formaldehyde.

III. MICROSCOPIC FINDINGS.

The sclerosis of the cerebral substance preserves on microscopic examination the same remarkable limitation to the central white matter which was noted in the gross. Except in the optic thalami, the limits of the white matter are nowhere transgressed by the neuroglia overgrowth. The exterior of the lesion in some parts of the occipital region follows the contour, and coincides precisely with the inner limits of gray matter. But, in general, the sclerosis corresponds rather to the body of white matter known as the centrum semiovale and may spare the intragyral portion of the white matter.

In spite of the massive character of the lesion, and the compactness of many portions of its structure, the overlying cortex fails to show major lesions, such as secondary changes in nerve cells due to the loss of their processes, or accumulations of phagocytic cells in vessel sheaths, or a reaction on the part of the neuroglia. It is noteworthy that even the upper or subpial layer fails to show a reaction on the part of the neuroglia, despite the frequency of this reaction under numerous conditions. The pia mater and its vessels are likewise free from lesion.

The extent and nature of the damage done by the lesion cannot be exactly determined. The volume of brain tissue remains

unaltered or has been slightly increased by the lesion. There has been at some time considerable destruction or alteration of tissue in the region, as is shown by dense deep masses of pigment-bearing phagocytic cells in the sheaths of the appertaining vessels. The myelin sheaths, and doubtless numerous axis cylinders, have been destroyed in the area of sclerosis. In certain areas which seem paved with neuroglia giant cells separated by a few delicate neuroglia fibrils, it is certain that the original elements must have been destroyed.

In other parts it is by no means certain that all or even the majority of the axis cylinders have been dissolved in the lesion. In a preparation stained with phosphotungstic acid hematein (Mallory) it is possible to follow certain myelinated fibers, in whose myelin sheaths a delicate skeletal substance may stain, till the fibers enter the sclerotic area and lose their myelin. Neither myelin nor the delicate substance within the sheath can be demonstrated in quantity within the sclerotic area.

The anilin blue stain (Mallory) for connective tissue is of service on this point. It is possible for instance, to demonstrate in this case, by means of the anilin blue stain, the secondary degeneration of fiber bundles about the Gasserian ganglion and the secondary degeneration of most of the central bundles of the optic nerve. Unfortunately the application of the anilin blue stain to the brain substance of this case is of less service. For it proves not possible to differentiate convincingly the supposed axis-cylinders from long cell processes of some of the large active neuroglia cells which characterize many parts of the sclerotic regions. However, so far as appearance without differential staining can convince, it is possible to say that at least some axis cylinders, minus myelin, penetrate the sclerotic areas. This would align the case with the cases known as multiple sclerosis.

The finer characters of the lesion are of interest, especially as bearing on the differentiation of gliosis from glioma.

The sclerotic tissue varies strikingly in microscopic structure, although the amount of intercellular substance is everywhere above that of the normal cerebral white matter. The variations are chiefly shown in the number and character of the neuroglia cells which produce the fibrils. The transitions in the mass of the lesion are never abrupt and never so well marked as the transition between the sclerotic tissue and the relatively normal

cortex. The neuroglia cells vary in number and size in the sclerotic tissue, just as they do in those focal overgrowths of neuroglia tissue which we know as glimata.

In places (characteristically along the exterior of the sclerotic tissue), the cells are small, placed at fairly regular intervals, and provided with branched cell-bodies which somewhat recall the characteristic cell bodies of reacting sub-pial neuroglia cells.

In other places (characteristically in the interior of the lesion), the cells are larger (often meriting the name giant cell), placed at smaller intervals (sometimes giving a paved appearance to the lesion), and provided with numerous overlapping nuclei which are crowded about the periphery of the cell. The centers of these large cells are homogeneous and finely granular and are provided with a varying number of centrosome-like structures.

In a few foci, there is a third type of cell in which activity seems to be spent on expansion of the cell-body and the production of numerous heavy, branched, and deeply staining processes, which are sometimes frayed at the ends like cut wire-rope.

In places there are remarkable clusters and rows of ependymal cysts, lined with perfectly formed ependymal cells, which are provided with basal bodies and attached cilium-like appendages. These cysts are not of diffuse occurrence but occur particularly in the neighborhood of the posterior horns of the ventricles. Occasionally the cysts are so aligned, between stratified masses of neuroglia coincident in direction with the major axis of the ventricle, that the impression is gained that such accessory cystic spaces are developed along with the ventricle and belong to its ground plan.

Over against these perfectly formed ependymal cysts may be set certain less regular cysts which are perhaps due to the hollowing out of the cytoplasm of some of the giant cells with peripheral nuclei noted above. Such irregular cystic spaces are, however, not common in this tissue.

The gradual variations in cell character above noted, taken together with certain variations in the amount and texture of the intercellular fibrillary substance (often particularly dense about vessels), are not inconsistent with the diagnosis, glioma. There is considerable evidence of tissue destruction throughout the sclerotic tissue in the shape of dense deep masses of pigment-bearing phagocytic cells in the vessel sheaths. The material so laid

down is probably derived from the destruction of nerve fibre constituents incident to the lesion, since there is nowhere any sign of necrosis in the sclerotic tissue itself and there is little or no accumulation of phagocytic cells in the overlying cortex or in the pia mater.

IV. SUMMARY.

1. Boy of six and a half years. Measles at three years. One year before death, fell backward down three steps in a cellar, with epistaxis, and possibly bleeding from ear. Afterward "nervous." A month later began to stagger in walking, became gradually deaf and stupid, later blind and dumb. Operation for chronic internal hydrocephalus. Death two days after operation.

2. The autopsy showed sclerosis of the white matter of the occipital, parietal, and temporal lobes on both sides with sclerosis of optic thalami and of small, roughly symmetrical areas in the white matter of the cerebellum.

3. The microscopic examination shows a cellular and fibrillary overgrowth of neuroglia, sharply limited to the white matter. The picture gradually varies from that of masses containing giant cells and few fibrils to that of active fibril-producing cell masses or that of stratified areas of inactive fibrillar gliosis.

4. The lesion involves the destruction of myelin sheaths and considerable axis-cylinder material. The lesion may be described as a multiform gliosis of the white matter with extensive mildly destructive properties. The nutrition of the areas is maintained. The overgrowth of neuroglia substitutes for, and to some extent destroys, the involved tissues, but fails to invade, in the sense of invasion by glioma. The overlying cortex fails to show important changes. The origin of the condition is unknown.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY.

December 5, 1905.

The President, DR. JOSEPH FRAENKEL, in the Chair.

A Case of Blindness, with Astercognosis.—This was presented by Dr. J. F. Terriberry. The patient was a man; 55 years old; a native of Canada; married, and of intellectual pursuits. His father met a violent death at the age of 30; his mother died at 70 of "dropsy." He stated that he came from a healthy stock, with no hereditary entailments. He was strong and vigorous in his early life, and continued to enjoy good health up to the time of his present trouble. He married at the age of 22, and shortly thereafter entered the Canadian Parliament, pursuing an active career in statecraft for a number of years. Following this, he engaged in railroad work in its various phases, until his present trouble incapacitated him.

For a period of about twelve years, after the age of 40, he used alcoholics freely but not steadily, and was exposed to venereal disease. He admitted having had gonorrhea and a soft chancre, but denied syphilis. He denied having been injured, and gave no history of malaria or rheumatism. He was greatly disturbed by business misfortunes and reverses for some years prior to his present illness.

Between three and four years ago, while his general health was apparently good, he became aware of a slight indistinctness or blurring of his vision, both eyes, seemingly, being equally affected. His vision slowly but steadily failed for a year and a half to two years, when it was reduced to its present condition of light form perception only. This failure of sight had been unaccompanied by symptoms of any kind until about one year ago; he had had no headache, no dizziness, nausea or vomiting, no phenomena of irritation of the visual tracts. About a year ago his wife noticed some awkwardness in his movements while dressing, and this had gradually become more marked, particularly on the left side.

Upon examination, the patient presented a good general appearance. He was well nourished, and his complexion was good. His face had the blank expression of a sightless person. The left shoulder drooped a little. The left hand, in repose, gave an expression of weakness quite evident when contrasted with the right. He was able to stand and walk well. There was no tremor of the hands, tongue or facial muscles.

The left knee-jerk was normal; the right was present, but less active. The Achilles jerks were obtained, but their action was slight.

Stroking the soles of the feet caused slight flexion of all the toes excepting the great toe, which remained motionless. No Babinski. The tendon reflexes of the upper extremities were normal. A chin reflex was obtained. Tapping the branches of the facial nerve elicited no response. (The pupils were regularly and equally dilated to double normal size. Light reflex was present, but reduced, and attempts at psychic accommodation by imagining that he was looking at near and remote objects caused no action in the pupils.) The senses of smell and taste were apparently normal, a watch was heard at the normal distance.

The patient was now handed a dynamometer and requested to grip it with all his strength, when it at once became apparent from the awkwardness with which he handled the instrument that there was some

difficulty with the stereognostic perception. Placing the instrument properly in his grasp, he recorded with the right hand, 18, 32 and 25; with the left hand, 25, 25 and 22.

The patient was requested to raise his arms above his head: this he did hesitatingly, raising the left arm part way only. He was asked to execute a number of arm movements, and was found utterly unable to do so. A number of different objects were placed in his hands, none of which he could name properly. His arms were placed in various positions, and he was unable to say what the positions were. In all of these movements, the left side was less competent, if possible, than the right. When asked to stand on the right foot, he stood on the left, and *vice versa*, or, apparently guessed at it. The muscle sense in the arms was absent and was very poor in the legs below the knees. When asked to cross his legs, he did so poorly. The sense of touch was good in the upper and lower extremities, and the same was true of pain and temperature perceptions. There was, however, some delay in recording these impressions. The localizing sense was *nil*. There was no ataxia of the upper or lower extremities. The bladder and rectal functions were normal. There was no change in his disposition.

Attempts at determining the condition of the visual memories were not conclusive, but were suggestive of partial failure. When asked if he recalled the appearance of his friends, he replied that he could recall the sound of their voices much rather than their appearance, and he believed that his memory for things seen was not good. The ophthalmoscope revealed a normal looking fundus. The urine was normal; the blood examination negative.

Dr. David Webster, who had made repeated examinations of the eyes of the patient shown by Dr. Terriberry, said there was nothing in the appearance of the optic nerves that would account for the loss of vision. At first, he had been inclined to believe that he saw evidences of a retrobulbar neuritis, but subsequent examinations by himself and his colleagues had failed to substantiate that diagnosis. The patient still had some vision, and it was apparently growing no worse. He was unable to count fingers, but distinguished objects that were placed before his face, and was able to exercise regularly in the corridor of the hospital without coming in contact with objects. The astereognosis, which was first noticed by Dr. Terriberry, was a very interesting symptom. Any piece of paper that was placed in the patient's hand he would simply recognize as money. His symptoms pointed to a cortical degeneration, which had perhaps invaded the visual centres. The case might be put down as one of visual astereognosis. Two or three weeks ago the patient first began to suffer from nocturnal incontinence, which was corrected by the use of the tincture of belladonna.

Dr. William M. Leszynsky said he had had the opportunity of examining the patient shown by Dr. Terriberry, and could corroborate all that had been said in regard to the symptoms. An interesting question to decide was whether the man's blindness was due to a lesion of the optic centres, or to one anterior to the corpora quadrigemina. This could not be satisfactorily determined from a study of the reaction of the pupils, as atropine had been instilled daily.

The speaker said he was inclined to the diagnosis of diffuse cortical degeneration involving the parietal and occipital areas, this being secondary to arterial changes.

Dr. Terriberry, in closing, said the duration of the man's illness was about four years, during which time there was a gradually increasing loss of sight. No other symptoms were noticed until a year ago. While the diagnosis was somewhat in doubt, the case was probably one of cortical degeneration. The etiological factor for this had not been made out. The man had used alcohol, but to excess; he had never been injured; he denies having had syphilis. The change apparently began in the occipital

region and extended forward toward the motor area, a little farther on the right side than on the left.

Osteoma of the Spine in the Cauda Equina Region.—By Drs. Max Mailhouse and William F. Verdi, of New Haven, Conn. The patient was a man, 44 years old, a widower. His family history was unimportant. He denied all venereal disease, and had two healthy grown-up children. For one year prior to the onset of his symptoms he had smoked and drunk to excess. Early in the summer of 1905, he had first noticed increased sexual desire, at times going to the extent of four or five sexual acts daily. He consulted Dr. Verdi on account of pain in the hypogastric region coming on in paroxysms, the first of which occurred in July. The pains were not very severe at first, but as time went on they increased both in severity and frequency. Subsequently, he began to complain of severe backache, also in paroxysms, at times brought on and aggravated by movement of the spine. An attack that occurred while he was sitting up was so severe that he could not bear to be removed to his bed. The pain radiated from the suprapubic region to the back, where he located it at about the second lumbar vertebra, a little to the left. Later on the pain in the back became constant, and soon after, severe pain in the testicles appeared, also paroxysmal, which was present at times together with the hypogastric pain. Subsequently, the pain extended to the upper and inner part of the thighs, and he also described the pain at times as passing straight from the pubis to the spine. During this period of suffering, he had lost about twenty pounds in weight; his pulse had become small and frequent, and he could sleep but little without the help of anodynes.

In addition to his spinal symptoms, the patient had noticed in August that his eyes began to ache, and early in October he observed that the vision in his left eye was failing. On October 17, he consulted Dr. A. N. Alling, who found a retrobulbar neuritis, as evidenced by a central scotoma, the disc appearing normal.

When Dr. Mailhouse first saw the patient, on November 1, 1905, he obtained the same history as did Dr. Verdi. There was no spinal tenderness, and nothing visible on the back. There was no anaesthesia nor analgesia on the trunk, legs, buttock, genitals or perineum; no paralysis; no contractures. The patient was able to stand on either leg. The knee-jerks were active, but there was no ankle-clonus nor Babinski. The plantar reflexes were extremely lively, and tactile sense very acute. Kernig's sign was marked. The general musculature was flabby, but there was no focalized atrophy; no special idio-muscular contractility. No vesical symptoms were present. On November 12, there was observed some weakness of the left internal rectus, as evidenced by a deviation of the left eye.

Diagnosis: Owing to the absence of vesical symptoms, and a loss of sensation of any kind, as well as the absence of paralytic phenomena and of marked changes in the deep reflexes, Dr. Mailhouse said he located the lesion below the conus, and considered it an irritative lesion of the nerve roots supplying the ilio-hypogastric, ilio-inguinal and genito-crural nerves; hence of the first and second lumbar roots, and inasmuch as the conus was not involved, he thought the seat of the irritation must be near the region of the second lumbar vertebra. A diagnosis was thereupon made of a tumor pressing upon the cauda equina at the level of the second lumbar spine, and, owing to the prominent irritative phenomena and the absence of motor involvement, and to the simultaneous involvement of the second and third cranial nerves, it was supposed to be a gumma.

Operation: This was performed on November 21, by Dr. Verdi, assisted by Drs. Wm. H. Carmalt and L. W. Bacon, Jr. The spines and laminae of the first and second lumbar vertebrae were removed, and nothing but a tense dura found. On removing the spine and upper edges of the third vertebra, however, the dura was seen to be pushed forward and com-

pressed against the body of the bone at an acute angle, and the finger could feel a bony growth occluding the canal. The remainder of the laminae and the tumor were then removed with the biting forceps, as the condition of the patient did not warrant a prolongation of the operation, such as the use of the saw and the removal of the tumor *en masse* would necessitate. It was estimated that the antero-posterior measurement of the tumor was five-eighths of an inch, and its vertical measurement half an inch.

Immediately on removal of the compressing body, the distorted dura returned to its normal position. The left half of the growth seemed to be slightly larger. In consistence it was decidedly harder than the laminae as experienced by the operator in its removal.

Two weeks had now elapsed since the operation. The wound had healed and the patient was able to sit up and was entirely free from pain excepting that referable to the wound. The eye symptoms were reported to have progressed to the degree of some ptosis, indicating greater involvement of the third nerve. The nature of the ocular affection had not as yet been determined. It apparently had no connection with the spinal lesion.

The President, Dr. Fraenkel, said these cases of osteoma of the spine were of very rare occurrence. He recalled a case seen seven or eight years ago in which there were evidences of a progressive intraspinal lesion, and which was explained at the autopsy by an osteoma of the processus odontoides atlantis.

Retro-Pharyngeal Carcinoma, with Metastases.—Dr. B. Sachs reported this case, and showed the specimen. The patient was a man, 35 years old, who was admitted to the Mt. Sinai Hospital last summer while Dr. Hirsch was on duty. The symptoms indicated increasing intracranial pressure, with more or less somnolence, slight hemiplegia, right-sided oculomotor palsy, and a double optic neuritis. The symptoms pointing to an intracranial growth were connected with a large retropharyngeal mass, which was regarded as the source of his trouble, and was supposed to have perforated the base of the skull.

The patient's symptoms gradually became more aggravated, headaches were intense, and multiple tumors developed in the scalp and various parts of the body. The retropharyngeal growth was rather soft to the touch, and was at first supposed to be a gumma. A section of the growth was submitted to Dr. E. Libman, of the Pathological Department of the Hospital, who, upon examination, found it to be a carcinoma.

The case resulted fatally, and the skull of the patient, which was exhibited by Dr. Sachs, showed multiple perforations, indicating the sites of the metastatic cancerous growths.

A Case of Brain Tumor.—Reported by Dr. William M. Leszynsky, with specimen. The patient was a male; 28 years old; single; born in Russia; a photographer. He was admitted to the Lebanon Hospital on October 28, 1903, with the following history: His father died of diabetes; his mother and sister were living and in good health. During childhood he had measles and scarlatina, without sequelae. He attended school, and was well developed mentally and physically.

His sister stated that when he was four years old he was struck on the forehead by a stone, which resulted in momentary loss of consciousness, but no further trouble followed. At the age of 13, he was frightened at the sight of the killing of a mad dog, and at once became hysterical and had convulsive fits several times daily for about three weeks. Soon after, his hands and feet began to shake almost constantly, and he would often fall asleep while standing, walking or eating. He recovered from this condition at the end of two years, and came to this country at the age of 15. Since then he had often com-

plained of heaviness in his head, and when once asleep, it was very difficult to arouse him.

About nine months ago he began to suffer from frequent attacks of severe general headache, preceded or accompanied by vomiting, and this had continued. About two months ago, vision began to fail, and blindness soon supervened. He now complained of headache, vertigo and general weakness, with a sensation of falling toward the right side. His appetite was fair; bowels regular; urination frequent. He had been moderate in the use of alcoholics. He admitted having contracted gonorrhea, but denied syphilitic infection, and presented no evidence of that disease.

Examination on admission showed a well nourished, intelligent young man, weighing 140 pounds. He was obliged to remain abed, being unable to stand or walk without assistance. His pulse was 84; regular. Temperature and respiration, normal. The heart, lungs, and abdominal viscera were normal. There was no tenderness on percussion over the skull; no rigidity of the neck muscles; both pupils were equally dilated and immovable; no perception of light in either eye; ocular motility normal; bilateral papillitis of six diopters, with numerous retinal hemorrhages; smell and hearing normal; slight left facial paresis of the lower branches; the gasp was weaker on the left side, and there was slight uncertainty in distinguishing objects with the left hand. Muscular power and resistance were otherwise good in all extremities. Both knee-jerks were equally active; no clonus; plantar, Achilles, cremasteric and abdominal reflexes normal. No objective sensory disturbance. Urine and blood examinations negative.

The patient was delirious at times, and had occasional attacks of headache and vomiting. These symptoms were relieved by cathartics and suitable diet. He gradually became worse, the symptoms increasing in intensity, and there was paralysis of the right external rectus. The grasp became decidedly weaker in the left hand, and there was occasional flexor rigidity of the entire extremity. Left astereognosis was pronounced, but disappeared from time to time. It persisted for minutes, hours, or days, being present and demonstrated at one examination and absent at another. Slight ataxia was present in the left hand, but muscular sense and the sense of position were preserved, and there was no disturbance of tactile, pain or temperature sensibility. There was diminished resistance in the left posterior thigh group; the left knee-jerk and Achilles reflex were exaggerated, and pseudo-clonus with general trepidation of both lower extremities were present, being more marked on the left side; both plantar reflexes were excessive, but of normal type. From time to time both lower extremities became rigidly extended and hyperaesthetic, when the slightest handling would produce extreme trepidation of both limbs, lasting several minutes.

He was kept in bed, and, in addition to general management, iodide of potassium was administered in increasing doses. Rapid improvement in all symptoms soon followed. Two months later, (December, 1903) the astereognosis, ataxia and external rectus paralysis had completely disappeared, the retinal hemorrhages had become absorbed, and the elevation of the optic nerves had receded to four D. The headache, vertigo, and vomiting had entirely subsided, and his general health was much improved.

In February, 1904, with the exception of the blindness and beginning optic atrophy, he was apparently in perfect health and able to walk about the wards and corridors without assistance other than the guidance required by a blind man in order to avoid accidents. Several

X-ray examinations were made with negative result. Cerebrospinal fluid (40 c.c.) was withdrawn by lumbar puncture and immediately resulted in a severe attack of headache. Thirty minutes of an aseptic solution of ergot were then given subcutaneously, and in a few minutes he fell into a sound sleep lasting about an hour, and awoke free from pain. The fluid was found normal. Lymphocytosis was not present. His condition being unchanged, he was discharged July 21, 1904.

He was then taken to an institution for the blind, where he remained until re-admitted to the Lebanon Hospital on September 23, 1904. At this time his bodily condition and general health were good. Careful and frequent examinations failed to reveal any evidence of disease of the nervous system, other than commencing post-neuritic atrophy. During his three months sojourn in the hospital, he occasionally complained of headache and vertigo. He was discharged January 1, 1905, and remained at home about six weeks. During this period his memory was good, and he was always rational in his conversation and manner, complained frequently of headache and vertigo, and often said he felt like falling.

He was again placed in an institution for the blind for about six weeks, where he became so ill that he was removed to the house of a relative. While there he had frequent attacks of severe and uncontrollable headache, with vomiting, delirium, and general convulsions, with loss of consciousness, varying in frequency from one attack every twenty-four hours to one every two hours. During the intervals, he was always rational. This condition continuing for several weeks, he was removed to the Kings County Hospital, May 15, 1905. He was admitted to the service of Dr. A. C. Brush, who noted, in addition to the blindness and papillitis, "memory poor, attention and volition slow; he complained of headache, and had occasional outbursts of delirium; examination otherwise negative in result. The diagnosis of cerebral tumor was made, but the growth was not localized. He remained in the same condition for ten days, and was found dead May 25, 1905."

The autopsy was performed by Dr. B. Joseph, Resident Pathologist, to whom the speaker is indebted for the specimen and the following notes:

"Skull somewhat enlarged. Calvarium normal. Numerous erosions of the internal surface of the right side of the skull. Right hemisphere about one-third larger than the left and intimately adherent to the dura. Pia mater on the right side altogether obliterated; on left side edematous. Cerebral cortex on right side thinned. Ventricular cavities filled with about eight ounces of clear serous fluid. Attached to the right internal surface of the right lateral ventricle was a tumor about the size of a hen's egg, of cauliflower-like appearance, and exhibiting discrete areas of darker and lighter colors. Upon section, the tumor gave a grating sensation to the knife. The posterior fornix of the right ventricle was enlarged to about twice its normal size. No further examination of the brain was conducted. Body section was not permitted. The tumor, upon microscopic examination, proved to be a small round cell sarcoma containing areas of calcareous deposits."

This is the second case of brain tumor occupying the lateral ventricle that has come under the speaker's observation. The first case was reported at a meeting of this Society in December, 1903. Both cases presented the following analogous features:—The patients were intelligent adults; both had frequent attacks of intense headache, vomiting, delirium and convulsions; a high degree of bilateral papillitis accompanied by early, total and permanent blindness; astereognosis, without any disturbance of general sensibility; the absence of paralysis involving the extremities; only a slight transient hemiparesis; the diag-

nosis of brain tumor involving the right hemisphere was made, but the exact location of the neoplasm could not be determined *intra vitam*. In both cases the tumor was found in the right lateral ventricle and proved to be sarcomatous.

Dr. Leszynsky said that on account of the marked and rapid improvement following the use of potassium iodide, it was thought for a time that a mistake had been made, and that the case was one of syphilitic basilar meningitis, but the autopsy proved otherwise.

Dr. Arthur C. Brush, of Brooklyn, who had seen the case reported by Dr. Leszynsky, said that while the patient was under his care he had shown the symptoms of brain tumor, but at that time it would have been difficult to localize it. No history was obtainable from the patient. He was dull and apathetic, and the answers he made to questions were not to be relied upon.

Familial Multiple Sclerosis.—Dr. I. Abrahanson showed two out of three brothers who were affected with this disease. The history of the three patients was as follows:—Edward M., aged 19 years; Louis M., aged 16 years, and John M., aged 15 years, all born in the United States of Bohemian parentage. Both parents and two younger children were alive and well. Two children, also unaffected with this disease, had died in infancy. There was no history of miscarriages. The father positively denied lues; his sister was epileptic; the mother's brother was insane. Otherwise, the family history was negative.

Edward M. was born prematurely at seven and a half months. His first tooth appeared when he was a year old. He was breast fed. Speech appeared early, and he could walk at eighteen months. He developed into a strong and bright infant. He had scarlet fever, measles, pertussis and varicella. At the age of six years he had his first epileptic seizure. There was an infrequent recurrence of these seizures; they were chiefly nocturnal and ceased in a year or two. Three and a half years ago he had malaria, and following it there was a return of the epileptic attacks, slight in character, being more tonic than the former fits. They also were nocturnal. About the same time, unsteadiness in the hands was noticed; later, tremor and some weakness, change in speech intonation and right-sided headaches. Subsequently, there was some unsteadiness in walking, but this was never so decided as in the other two patients. The special senses were not involved; the sphincters remained intact. He was formerly a fair penman, but his writing became very tremulous, and at times illegible. He had to give up his position as druggist's assistant, and now acted as a driver on a wagon. He was always much brighter than the other two boys. Of late, an alteration in his facies had been noticed, his cheeks having become sunken.

Examination showed a tall lad, fairly well-nourished, with many stigmata of degeneracy. His gait was fairly good, but attempts at balancing showed unsteadiness. There was no Romberg. The pupils were equal and reacted normally. The ocular movements showed some nystagmiiform twitchings in extreme positions. There was a tremor of the facial muscles and some tremor of the tongue. The left pharyngeal innervation was stronger than the right and the pharyngeal reflex was present. There was some tremor of the head; the laryngeal movements were normal; triceps and wrist jerks were present; motor power in the upper extremities was fair; myotatic irritability normal; there was a coarse oscillatory tremor of the hands when extended; ataxia in the upper extremities; deep sensibility was unimpaired; the heart, lungs and viscera were normal; the abdominal and cremasteric reflexes were present; some scoliosis; knee jerks and Achilles jerks lively; no clonus; Babinski present on both sides; motor power in lower extremities normal; some unsteadiness; general sensibility unimpaired, subjectively

and objectively; optic discs showed temporal atrophy; no limitation of the visual fields; hearing normal; range normal; other special senses unimpaired; no atrophy nor vaso-motor disturbances; speech rather monotonous, and not as scanning as was the case with his brothers. The course of the disease was not steady, as there were distinct remissions and exacerbations; no forced laughter. He was decidedly the least involved of the three.

Louis M., born at full term; breast fed; first tooth at one year; walked at eighteen months, speech early; strong as a child, but never bright. Had pertussis, measles and varicella. When he was seven years old he had his first epileptic fit. These attacks were frequent and general in character; chiefly nocturnal. Soon after the onset of his epileptic seizures, tremulousness of the hands was noticed. Later on, the tremor spread to the body and the head, and at the same time unsteadiness in the hands developed, together with a progressive alteration of the gait, which became shuffling and unsteady, especially on exertion. The speech also became progressively involved. The facies changed in the course of time, and a tremor of the right face was noticed, especially when speaking or exerting himself in any way. His writing, which was once intelligible, was now a scrawl. The sphincters were unimpaired. The patient complained of paraesthesia of the hands. There was no forced laughter.

Examination showed a rather undersized lad; stooped; left shoulder higher than the right; sunken cheeks; listless, unintelligent face; movement of the right facial muscles; marked head tremor when walking, etc.; gait shuffling and unsteady; slight stiffness; no Romberg; pupils equal and reacting normally; nystagmiform movements in extreme positions; right facial innervation stronger than the left; fibrillary tongue tremor; tremor of the pharyngeal and laryngeal muscles upon intention; coarse oscillatory tremor of the hands and conveyed to the body; unsteadiness in the upper extremities; decided intention tremor; motor power fair; deep sensibility normal; wrist jerk normal; triceps lively; no wasting; scoliosis, with convexity to the left; heart, lungs and viscera normal. Upper abdominal and cremasteric reflexes present; knee jerks lively; Achilles lively; no clonus; Babinski on both sides; big toes in constant extensor position; extension of the first phalanges and flexion of the rest. Motor weakness in the lower extremities; ataxia present; no loss of deep muscular sensibility; general sensibility intact; optic disc showed atrophy in both eyes; vision normal; range normal; speech distinctly monotonous and scanning; intelligence decidedly subnormal. In this patient the somatic signs were most marked.

John M., birth normal; breast fed; first tooth at one year; walked at eighteen months; speech at two years; speech very slow and indistinct, even at the start. The patient had measles, varicella and pertussis. His intellectual condition was always subnormal. The first symptom of his present illness was tremor and unsteadiness in the hands. At the age of nine he had his first epileptic attack; these recurred at irregular intervals, and were always nocturnal. He had frequent diurnal headaches; never dizziness.

Examination showed a poorly nourished lad, stooped; scoliotic; sunken cheeks; many stigmata of degeneracy; pupils normal; some weakness of both external recti, and nystagmiform twitchings in extreme positions; tremor of the facial muscles upon intention; fibrillary tremor of the tongue; pharyngeal reflex present; head tremor upon intention; deep reflexes of the upper extremity present; oscillatory tremor of hands when extended; also intentional tremor; ataxia in the upper extremities. As in the other cases, closure of the eyes did not accentuate the tremor nor unsteadiness. Lungs and kidneys normal;

mitral insufficiency; other viscera normal; cremasteric and lower abdominal reflexes absent; scoliosis; knee jerks and Achilles lively; Babinski both sides; unsteadiness in lower extremities; deep sensibility intact; general sensibility normal; special senses normal; optic discs normal; speech scanning and very indistinct; intelligence markedly subnormal; no forced laughter.

The Etiology, Prognosis and Treatment of General Paresis.—Dr. Joseph Collins, who presented this paper, said that in regard to the etiology of general paresis there seemed to be a remarkable unanimity of opinion existing amongst those who had seen and studied the disease sufficiently to entitle them to the expression of an opinion. Kraft-Ebing summarized our knowledge of the subject in his statement that syphilization and civilization were the cause of the disease. It was probable that neither one was an adequate and determining cause. In uncivilized countries where syphilis existed, general paresis was unknown, but as civilization disseminated, general paresis crept in. The factors of civilization that contributed to the causation of general paresis need not be discussed. It was an intangible something that proceeded *pari passu* with the progress of civilization, apparently, for general paresis was more frequent with each succeeding generation. We called it strife and worry and work, without knowing that it was any of these. It might be a habit of life; it might be the food we ate; it might be an evolutionary condition that allowed a certain flora to develop in the gastrointestinal tract, and so provide the initial step for the development of the disease.

Dr. Collins said that in order to introduce a discussion of the causation of the disease, he had taken the last 100 cases of general paralysis he had seen, 50 from private practice and 50 from hospital practice, and had analyzed them. This comparatively small number had been taken, first, because they were fairly complete; and, second, because it seemed to him that as much and as reliable data could be gotten from 100 cases as from 500.

Of these 100 patients, 85 were males and 15 were females. So far as professions and occupations were concerned, it was difficult to find one that was not represented. There were clergymen, physicians, jurists, statesmen, bankers, capitalists, and laborers and artisans of all sorts. Of the 100 cases, there were no less than 23 in which there was a history in the ancestry of organic or functional nervous disease of sufficient severity to be noted by the family of the patient.

Syphilis: A history of syphilis was obtained in 55 of the 100 cases, and denied or not obtained in 45. There was a history of injury in nine cases; in 54 cases there were no excesses; in 23 there were moderate excesses, and in 23 this was admitted as an excessive factor. 73 of the cases were of the paretic type; 27 of the tabetic type. In addition to the 55 who admitted and who were in a mental condition to state that they had had syphilis, there were seven whose collateral history made it fairly certain that they had suffered from that infection. This made a total of 62 out of 100 in which it was certain that a syphilitic infection had existed. In two other cases there was presumptive evidence of a syphilitic infection. This left 23 patients who denied syphilis, and who gave no evidence of its ever having existed. On the other hand, there were many patients seen for the first time in a more or less advanced stage of the disease, who were not in a mental condition to give reliable information as to whether they had or had not had syphilis.

The average age at which these 100 patients had syphilis was 25 years, and the average age when general paresis developed was 36 years; thus about eleven years was the average period that elapsed between the infection and the development of the first symptom of the disease. In many cases, however, the time between the existence of

the chancre and the development of the first symptom of general paresis was very short: for instance in one case the specific lesion developed at the age of 36 and the general paresis at 41; in another case the syphilitic infection occurred at 31, and the first symptoms of general paresis at 34.

Alcohol had a definite relationship to the development of general paresis, but here again the question was whether or not it was in itself a competent, producing cause. Dr. Collins said that in his opinion it was not.

When one approached a discussion of the treatment of general paresis, he was confronted at once with the fact that it was practically universally conceded that the disease was incurable. The speaker referred to the use of mercurials in massive doses, as recommended by Leredde and others of the French school, and stated that his own experience with the intensive mercurial treatment of tabes and general paresis now extended over a period of five years, during which time he had treated many patients in this way. In no instance had he seen intensive mercurialization to be of any service whatsoever in general paresis after the disease had been fully developed; i. e., after it had the ordinary somatic and psychical signs, even though the latter were not pronounced. He had had three cases in which it seemed to him that the disease had been arrested in its development; not cured, because the physical signs of the disease still remained.

In concluding his paper, Dr. Collins emphasized the importance of an earlier recognition of the disease.

Dr. M. Allen Starr said that from his own experience he could corroborate much that Dr. Collins had said in regard to the etiology of general paresis. A year ago Dr. Edward L. Hunt, one of his assistants at the Vanderbilt Clinic, went over the statistics of the Clinic for the past seven years and analyzed the cases of general paresis that had come under observation there. The result of his investigations corroborated to a large extent the statement made by Dr. Collins, and the same was true of an analysis of one hundred consecutive cases seen by Dr. Starr during the earlier years of his practice. Of those one hundred cases, the histories were practically complete, the patients having died. The statistics, both from his personal and dispensary cases, agreed very closely. Over 59 per cent. were clearly, unquestionably syphilitic. Of the cases he had seen in private practice, 64 per cent. were undoubtedly syphilitic. The speaker said that he differed with the statement of certain French and German writers that all cases of general paresis and tabes were syphilitic: on the contrary, he believed that in many instances, both of these affections were distinctly non-syphilitic. Many, as Dr. Collins had said, were due to trauma and many were due to alcoholism, and a certain number could not be accounted for on any of these grounds, but were due to the wearing out of the brain tissue in connection with the stress and strain incident to the worry of an active, energetic life.

Dr. Starr said that an analysis of a large number of cases of general paresis had convinced him that the early symptoms of the disease did not correspond very closely with the statements in the text-books. In only 20 per cent. of the cases he had observed were there any mental symptoms at the outset, leaving about 80 per cent. in which the physical symptoms appeared before the mental phenomena. In the latter cases there was no exaltation; no failure of memory at the beginning. The speaker emphasized, as Dr. Collins had done, the importance of a careful physical examination in every case of so-called neurasthenia, because the early symptoms of general paresis manifested themselves in ways that would tempt one to make the diagnosis of neurasthenia if one contented himself with a superficial examination. The presence

of the Argyll-Robertson pupil, a tremor of the face and tongue, marked exaggeration of the knee-jerks or their persistent absence were significant early symptoms of general paresis. Another symptom which the speaker had found of considerable importance was what he called the reaction time of the patient. This was measured by means of the Galton instrument, which consisted of a pendulum swinging backward and forward in exactly one second. The pendulum could be immediately started and arrested by the pressure of a finger on a key. The patient sat with his finger on this key, and was instructed to press the key simultaneously with the exhibition of a light or color, or upon the striking of a bell. By this method it was a very simple matter to determine the reaction time of the patient. Dr. Starr said he had resorted to this test in many cases of neurasthenia and general paresis, and he had found that in the former condition the perception was very keen at the beginning, but gradually decreased after repeated tests, while in general paresis the perception was below the normal from the very start, and the time reaction lengthened as the disease progressed. He thought this test was of some value in differentiating between general paresis and neurasthenia. The differential diagnosis was of great importance because of the question of prognosis and treatment. It was well known that there were cases that presented all the symptoms of general paresis that were actually cases of cerebral syphilis. He recalled such a case where, after a diagnosis of general paresis, the patient recovered under anti-syphilitic treatment, and was now in good health after fourteen years had elapsed. About 15 per cent. of the cases of general paresis began with the symptoms of hemiplegia; about 20 per cent. with the symptoms of neurasthenia and sleeplessness, and about 20 per cent. with some signs of exaltation. This behooved the neurologist to be very careful in his diagnosis, and in every instance the patient should be given the benefit of the doubt and put upon specific treatment.

Dr. B. Sachs said the difficulties of the subject were largely due to the fact that although the greatest effort had been made during the past fifteen years to establish an accurate clinical picture of general paresis, the more closely the disease was studied, the more we became impressed with the idea that the term general paresis unquestionably included a number of very divergent clinical pictures, and for that reason any statistics that were collected would naturally differ and be somewhat misleading. The speaker said he was in entire agreement with Dr. Starr that there were certain cases of cerebral syphilis or pseudoparesis which could not, at certain stages, be differentiated from genuine dementia paralytica.

In discussing the question of dementia paralytica occurring late in life, Dr. Sachs said that of 283 cases seen at Bellevue in the year 1904, at least 14 per cent. occurred after the age of fifty; 4 per cent. after fifty-five, while only seven-tenths of one per cent. occurred after the age of sixty. 72 per cent. occurred between the ages of thirty and fifty.

In regard to the interval between the original syphilitic infection and the development of the first symptom of general paresis, Dr. Sachs said he could recall at least two cases in which the mental disorder was recognized within less than one year after the initial infection, and the subsequent course of events verified the diagnosis. He had seen a number of other cases in which the general paresis developed within three years after the chancre.

As to the curability of the disease, Dr. Sachs said he wrote an article some years ago in which he spoke very hopefully of the prognosis, especially if the condition was recognized early. That paper was written some eight years ago, and he was now prepared to make

one statement very positively. After an experience of over twenty years, during which he had observed several hundreds of cases of general paresis, he could not recall a single instance where the patient had survived over eight years. When the diagnosis of general paresis was honestly and carefully made, the claim could not be established that the disease was curable. In spite of that fact, it would be a great mistake to abandon efforts at treatment, and simply pronounce every case incurable. Mistakes in diagnosis were not infrequent, and with that possibility in mind, the patient should always be given the benefit of the doubt and receive a thorough course of anti-syphilitic treatment, particularly if the case was seen early. While he was far less hopeful in regard to the curability of the disease than he was eight or ten years ago, he still believed that justice to the patient demanded that anti-syphilitic treatment should be given a trial.

So far as the etiology of the disease was concerned, Dr. Sachs said he believed there was at least one other important etiological factor besides syphilis, and that was trauma. The same was true in reference to tabes. Syphilis, of course, was the most important factor.

Dr. Adolph Mayer said we should always be prepared to acknowledge that a diagnosis of general paresis could not be said to be absolutely certain in more than about 90 per cent. of the cases that came under observation under that name. There was a margin of about 10 per cent. where we had to depend on the autopsy and anatomical findings, and then the question arose, what anatomical findings should we consider as being conclusive evidence of general paresis, a question which should be discussed to put the entire problem of the etiology and therapeutics of general paresis on a safe basis.

Dr. Meyer said there were, of course, cases in which alcoholism was the only ascertainable etiological factor, while other cases appeared to be due to trauma. We should, however, remember how very difficult it was to absolutely exclude syphilis in a case of general paresis, and while it was not necessary nor even justifiable to proclaim, *pro publico* that every case of tabes and general paresis must be of syphilitic origin, we could give our statistical facts as evidence in favor of our conviction, and we should with equal sincerity admit that we had no means to exclude previous syphilis positively in any case.

The speaker suggested that when Dr. Starr claimed that in only 20 per cent. of his cases were early mental symptoms noted, he must have had in mind the so-called legal insanity. If we took legal insanity as a standard in psychiatry, we would have a poor task in psychiatric diagnosis. As a matter of fact, we had to depend on much more subtle evidence, and we would consider above all things the non-concern over blunders by the patient which made even slight memory defects appear as an ominous feature. These, and many changes of character and judgment need by no means reach the standards of legal insanity to become decisive factors in the diagnosis, and were certainly much more conclusive than changes of reaction time. A great difficulty was connected with our ignorance of the bearing of many relatively insignificant disorders that sometimes appeared after syphilis: such, for example, as an Argyll-Robertson pupil. He referred to cases with previous syphilis and perhaps with one Argyll-Robertson pupil, in whom recurrent attacks of manic excitement were very difficult to interpret.

With regard to the administration of anti-syphilitic remedies, Dr. Meyer said we should realize that it meant hardly more than a desire to spare the patient the consequences of a possibility of error of diagnosis. It had really no other logical foundation. Inasmuch as there was hardly any reason to fear that a case of cerebro-spinal syphilis would become one of general paresis on account of delay of such treatment. Probably nothing would be lost in any case if we should wait

until the diagnosis became more obvious. Under all circumstances, the "result" of such treatment would be a treacherous guide in the diagnosis.

Dr. H. A. Diefendorf, of Middletown, Conn., said that on account of the lateness of the hour he preferred not to read his paper on the etiology of general paresis. He wished, however, to record the fact that in his series of 164 cases, in a community one-third of the population of which was rural, he had found that the prominence of the various etiological factors certainly was at variance with that brought out by some of the previous speakers. He had become convinced that excessive alcoholism was an important primary etiological factor, and in some cases he had observed it occurred in over 54 per cent. In his community, the negroes paretic was far in excess of the white female paretic, in the proportion of ten to one. In five per cent. of his cases the mental symptoms had immediately followed an injury.

The Etiology of General Paresis:—Dr. M. S. Gregory read this paper, which he said was based on a fragmentary resumé of the writer's clinical experience gained during the past four years in the Psychopathic Wards of Bellevue Hospital. Over 1,000 cases of general paresis had been admitted during that time. The disease had represented 13 per cent. of the total admissions into those wards, and composed 21 per cent. of the total male, and 5 per cent. of the total female insane patients. The relative proportion of the sexes suffering from general paresis had varied from year to year. In 1903 there were more than six times as many male as female paretics; in 1904, the proportion was four to one. For the three years, the average had been five men to one woman. Thus the women represented about 20 per cent. of the paretics admitted.

In at least a third of the patients, the histories obtainable were for obvious reasons not as complete as might be desired: many were foreigners, without any friends, and one had to depend largely on the history as given by the patient, who was frequently brought to the hospital following an episodic attack, and was, as a rule, in a condition of extreme mental confusion. Most of the patients admitted to the Psychopathic Wards at Bellevue came from the very lowest strata of society, and they, as well as their friends, were usually too ignorant to give a complete history. Owing to the short time the patients remained in the hospital, the opportunities for obtaining adequate histories were necessarily limited. In view of these difficulties, therefore, the histories of 250 cases had been selected for analysis. They were those of patients admitted consecutively, and did not include those in which the defects spoken of had been marked.

Age: In the 250 cases analyzed, the age of the patients ranged from 18 to 65 years, the majority being in the fourth and fifth decades of life. Several were under 22 years, the youngest being a woman of 18 who had contracted syphilis at the age of 13. The oldest was a man of 64.

Civil Condition: Of this series, 75 per cent. of the patients were married.

Nationality: Almost all nationalities were represented. There were 76 native born; 70 Germans; 48 Irish and 35 Hebrews. There were two negroes and two Japanese.

Occupation: Laborers were naturally the most numerous. Among the better class of patients were five actors, three merchants, two physicians and two lawyers.

Heredity: A family history of mental disease was obtainable in about 20 per cent. of the patients. In 12 per cent. the family history showed various disorders, such as Parkinson's disease, hysteria, epilepsy, neurasthenia, etc.

Alcoholism: In about 25 per cent. of the patients there was a distinct

history of alcoholic abuse. In six cases, the intemperate use of alcohol was given as the chief cause.

Miscellaneous: In 12 cases the assigned cause was traumatism of the head; in 6, overwork; in 4, grief and business worry; in 3, "stomach trouble"; in 3, rheumatism, and in one, la grippe.

Syphilis: A positive history of syphilis was obtained in 99 of the male patients; about 45 per cent. In 33 others there was a strong presumptive evidence of syphilis. In 16 cases, in which specific disease was denied, there was a history of repeated miscarriages or sterility in the patients' wives. In addition, several presented superficial scars and bone enlargements. 21 gave a history of chancroids, or repeated urethritis.

Among the female patients, a positive history of syphilis was present in six cases, 20 per cent. Two gave the history of an initial lesion, and in four the husbands admitted having infected their wives. In nine, there was a history of repeated miscarriages, with a confession on the husbands' part that they had had chancre "many years previously." Two patients had chancroids and gonorrhea. If these incomplete histories could be regarded as indications of luetic infection, the percentage of syphilis in this series would be 80 per cent. in men and 56 per cent. in women, the average of all being 78 per cent. In these 250 cases, the shortest period of development after the initial lesion of syphilis was five years; the longest, 36 years.

Dr. Gregory said that in recapitulation it seemed that clinically speaking, three factors were necessary for the development of paresis, and they were, in the order of their importance: (1) hereditary or constitutional predisposition; (2) syphilis; and (3) an exciting cause, such as stress of life, mental or physical strain, trauma, or intoxications of various kinds.

Prognosis: The prognosis of a true cases of paresis, Dr. Gregory believed, was bad, and uniformly fatal. He was inclined to think, however, that the general tendency had been to give too gloomy a prognosis as to the rapidity of the progress of the disease, for at least some of these patients. One could never be certain as to the remissions.

Periscope

University of Pennsylvania Medical Bulletin

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1. The Motor Area of the Human Cerebrum, Its Position and Subdivisions, with Some Discussion of the Surgery of This Area. CHARLES K. MILLS AND CHARLES H. FRAZIER.
2. The Occasional Clinical Resemblance Between Caries of the Vertebrae and Lumbothoracic Syringomyelia, and the Location within the Spinal Cord of the Fibers for the Sensations of Pain and Temperature. WILLIAM G. SPILLER.
3. A Case of Amyotrophic Lateral Sclerosis in Which the Symptoms Were Unilateral and Ascending. CHARLES S. POTTS.
4. A Case of Tumor of the Left First and Second Frontal Convolutions with Motor Agraphia as Its Chief Localizing Symptom; Successful Removal of the Tumor. J. W. McCONNELL.
5. A Study of the Contractures in Organic Nervous Diseases, and Their Treatment. T. H. WEISENBURG.
6. The Difficulty of Diagnosticating Between Tabes and Cerebrospinal Syphilis, with a Report of Two Illustrative Cases. CARL D. CAMP.

1. *The Motor Area of the Human Cerebrum.*—The history and literature of the subject is summarized, attention first being directed to the paper by Lamacq, published in 1897, on the cortical motor areas of the human brain, as determined by faradic excitation of the cerebral hemispheres of man. Lamacq included in his paper a series of unpublished cases furnished by Dr. W. W. Keen of Philadelphia. Most of the work done in this field has come from American neurologists and surgeons. Since 1897, contributions on the subject referred to by the authors include recent articles by Krause, Rothmann and Brodman. Attention is directed to the observation on anthropoids of Grünbaum and Sherrington, who hold that the motor region is situated cephalad of the central fissure. The authors next recall in some detail, because of their historical value and the striking results obtained, three of the earliest series of observations made in Philadelphia in 1888, those of Keen, of Lloyd and Deaver and of Mills and Hearn. It is notable that in the case of Mills and Hearn the results obtained were all from applications made cephalad of the central fissure. Next a series of hitherto unpublished observations is given. In seven of these cases operation was performed by Dr. Frazier, the cases, as indicated in the summaries, having been in the care of Drs. Mills, Spiller or McConnell, or having been directly in the service of Dr. Frazier. Notes of the experimentation on three other hitherto unpublished cases are given, these having been furnished by Dr. W. W. Keen.

In order to get some data of value with regard to the position of the motor area with relation to the central fissure, an analysis is made of the results of faradic applications in twenty-five cases. The result of the analysis is given in tabular form as follows:

Number of cases.....	25
Number of applications.....	138
Responses in front of central fissure.....	62
Responses behind central fissure.....	20
Responses in uncertain position as to central fissure..	14
No response in front of central fissure.....	14
No response behind central fissure.....	28

The data are altogether in favor of the view that the motor region is in front of the central fissure. Mills in 1888 wrote that the facts then obtained upheld the view that the motor zone, in man at least, is much more extensive in front of than behind the fissure of Rolando. The exact limitations and main subdivisions of the motor zone, according to the views of the writers, are then given. This zone is placed entirely cephalad of the central fissure and largely in the precentral convolution, with a forward projection which includes portions of the second and third frontal gyres. The motor zone and its subdivisions in the human brain are represented in a new scheme or diagram. The subdivisions of the areas for the face, the eyes and the head, the arm, the trunk and the leg are then discussed in detail. Experiments on the cadaver were performed to corroborate the accuracy of the methods employed, not only for exposing the central fissure and the lesion related to it, but also for the selection of the points to be faradized. The exact method of using the current is given. In the observations of the authors, the method of unipolar faradization was employed, in most of the previously published cases, Keen's bipolar electrode having been used. Grünbaum, Sherrington and Krause, in their observations on the anthropoids, resorted to unipolar faradization, and the authors discussed its value, and also the necessity of an exact and careful technique. The paper closes with a discussion of the subject of craniometric lines and craniocerebral relations. It contains five illustrations, namely: (1) A scheme of the motor zone and its subdivisions; (2) the Anderson-Makins lines and the usual osteoplastic flap for exposing the motor region; (3) bony and dural flaps reflected so as to show the convolutions of the motor area (4) reflected osteoplastic flap in cadaver operation, showing the places of insertion of pins at points of selection for precentral and postcentral faradization; (5) drawing of the brain after calvarium and membranes were removed, showing the position of osteoplastic opening with reference to the fissures and gyres of the motor region. (Author's abstract.)

2. *Lumbothoracic Syringomyelia and Caries of the Vertebrae*.—Attention is called to the infrequency of lumbar or sacral syringomyelia, and reference is made to the few cases in the literature. The following case observed by the author is reported: A woman, aged at present thirty-six years, has symptoms confined to the lower limbs, if inequality of the pupils is excluded. In the right lower limb pain and temperature sensations are much diminished; while tactile sensation is prompt, the patellar tendon reflex and Achilles tendon reflex are lost; the limb is flaccid, and its movements in walking seem to be a little ataxic, while voluntary power is about normal. In the left lower limb all forms of sensation are normal, weakness is distinct, the patellar reflex is exaggerated, and patellar clonus and ankle clonus are present; the limb is a little spastic, and its toes are dragged a little when the patient walks. Babinski's reflex is present on each side. It is a Brown-Séquard paralysis (weakness in the left lower limb, dissociation of sensation in the right lower limb), with spasticity and exaggerated tendon reflexes in the left lower limb, and flaccidity and loss of tendon reflexes in the right lower limb.

A lesion in the left half of the spinal cord in the thoracic region and above the lumbar region would explain the weakness of the left lower limb and the exaggeration of the tendon reflexes and the presence of the Babinski reflex in the left lower limb; also the dissociation of sensation (reservation of tactile sensation, with more impairment of temperature and pain sensations) in the right lower limb, because the sensory fibers from the right lower limb cross soon after entering the cord to the left side. We must assume that the crossed pyramidal tract and other parts of the lateral column, especially Gowers's tract on the left side, are affected, but the gray matter of the anterior and posterior horns of this side cannot be diseased in the lumbar region, or there would be atrophy and loss of tendon reflexes in the left lower limb. To explain the loss of tendon reflexes and

the flaccidity in the right lower limb without atrophy, we must assume that there is a lesion of the right posterior horn of the lumbar region without involvement of the right anterior horn, as no atrophy has occurred, even after two years, and we should expect atrophy were the anterior horn cells diseased. The lesion may affect slightly the right crossed pyramidal tract, because of the Babinski reflex and possibly slight weakness on the right side, but it cannot greatly impair this tract, as the weakness of in the left lower limb. The lesion must, therefore, involve much of the right lateral column, as sensations of pain and temperature are normal in the left lower limb. The lesion must, therefore, involve much of the left half of the cord in the thoracic region, but not extend into the left lumbar region very far, and must implicate the right posterior horn in the lumbar region; it must also be a slowly developing lesion, and nothing suits these conditions so well as syringomyelia. A second case is as follows: A man, aged twenty-three years, had resistance to passive movements slightly diminished in the lower limbs. Sensation for touch was normal or nearly normal in the lower limbs, but sensation for pain was abolished or almost abolished in these parts. Temperature sensation was almost lost in the lower limbs below the knees, and much impaired in the thighs and lower part of the trunk. Walking was difficult because of the deformity of the knees. He had a slight kyphosis at about the tenth thoracic vertebra. The upper limbs and face were not affected.

After a fall backward down a flight of steps he became completely paralyzed in the lower limbs. Sensation for touch was then lost in the right lower limb for a time, but was preserved in the left lower limb. Sensations for pain and temperature were lost in the right leg and foot and in the left foot, but were preserved elsewhere, although it is not stated that they were normal elsewhere. The patellar reflexes were much exaggerated, and Babinski's sign was present.

Still later sensation for touch was found preserved everywhere in the lower limbs. Sensation for pain was irregularly present in the lower limbs, the response to pain stimulation being very uncertain, and sensation for temperature was also much impaired in the lower limbs.

Tuberculous meningitis and caries of the vertebræ were found, and a small tubercle was present in the right lateral column at the extreme lower end of the thoracic cord, involving the area of Gowers's tract. About one-half to one inch higher another small tubercle was found involving the left tract of Gowers. Although there was some myelitis, it was very evident from the symptoms that it had chiefly developed after the fall down the flight of steps, as at the time the patient first came under the author's observation weakness in the lower limb was slight. (See this Journal, 1905, p. 318.) It is important to note that in this case the lesions of long duration were evidently the tubercles in Gowers's tracts, and they best explain the dissociation of sensation of the syringomyelic type; also that when the patient first came under observation there was probably little diffusion of the lesions because of the very slight motor involvement. (Author's abstract.)

3. *Amyotrophic Lateral Sclerosis*.—After reference to ten similar cases collected by Spiller ("Primary Degeneration of the Pyramidal Tracts," etc., *Jnl. of Penna. Med. Bulletin*, vol. xvii, p. 390), the history of the case follows: A man, carpenter by occupation, who had worked in a lead works for the past eighteen months. Nothing else of note in the previous history. Six months before coming under observation he first noticed weakness of the left leg. Several weeks after this, weakness was noted in the left arm, and still later bulbar symptoms appeared. Examination revealed weakness of the muscles about the angles of the mouth on both sides; weakness and atrophy of the tongue; difficulty in swallowing; a slurring and indistinct speech, with impairment of motion of the right vocal cord. There was marked weakness of the left arm and leg; a much

less degree on the right side; marked atrophy of intrinsic hand muscles with claw hand deformity on the left, slight atrophy of the same on the right. The left leg was very spastic and the foot was dragged when he walked. The Babinski reflex was present on both sides, and all of the tendon jerks (arms and legs) were increased. Fibrillary tremors were observed. There was diminished faradic contractility in the atrophied muscles, and he was very emotional. This patient¹ was exhibited to the Philadelphia Neurological Society. (Author's abstract.)

4. *Tumor of the Left First and Second Frontal Convolution, with Motor Agraphia.*—The author of this paper first speaks briefly of the difference of opinion with reference to the existence of a separate motor agrapnic center, and then presents the details of an interesting case. A right-handed man, twenty-eight years old, without syphilitic history and without any preceding history of importance except that he had had a fall when eight years old, striking on the occiput, had a convulsion for the first time in February, 1899. One year later he had a second seizure, six months later a third, a fourth in December, 1900, and in June, 1901, a series of four attacks in three days. After this he had convulsive attacks somewhat frequently, these, from the description of his wife, appearing to be general and attended with unconsciousness. In May, 1904, he began to have frequent local spasmodic attacks without unconsciousness, these having been as numerous as twelve in two hours. In these attacks the right side of the face was affected, including movements of both eyelids and sometimes rotation of the head to the right. After the attacks he was confused and his speech was thick. He was admitted to the Hospital of the University of Pennsylvania, May 18, 1904. Examination shortly after admission showed paresis on the right side of the face, including the levator palpebræ and palpebral orbicular muscles. Sensation seemed to be less acute on the right side of the face, as evidenced by the less amount of wincing of the patient on examination. Speech was thick, but by close attention what he said could be made out. The speech defect appeared to be due to paresis of the muscles of articulation, enunciation and phonation. He had no difficulty in reading print, writing or numbers, or in recognizing and correctly naming objects. He could not write either spontaneously or from dictation, although he held his pencil correctly; but writing from copy was practically perfect. A letter written two years before coming under observation showed omissions, faulty spelling and formation of words and letters in one part, which words were elsewhere spelled correctly or the letters properly formed. Specimens of later date show an exaggeration of these conditions up to the point of complete inability to write, as evidenced in the specimen of May 19, 1904. His memory and powers of attention had considerably failed. Examination showed no optic neuritis. Operation was performed by Dr. Charles H. Frazier, May 21, 1904. The anterior margin of the opening was two inches in front of the central fissure. The opening was subsequently enlarged in a forward and upward direction. A tumor was removed which was apparently situated so as to lie across the foot of the second frontal convolution, encroaching somewhat on the lower half of the first, slightly upon the upper posterior portion of the third and the anterior edge of the precentral convolution. After the operation, paresis of the right side of the face and to some extent of the right hand were present. Speech was immediately better, but the agraphia persisted. Specimens of his attempts at writing both before and after the operation were given. Gradually after the operation his writing improved so that by June, 1904, he wrote a letter of more than a page, of good construction and almost perfect spelling. A specimen of his writing at this time is also given. The history of the subject of motor agraphia is briefly reviewed, including a reference to the

¹ JOUR. NERV. AND MENT. DIS., 1900, p. 556.

cases of Charcot and Dutil, Eskridge and Gordinier. The case is regarded by the author as additional evidence of the existence of a motor graphic center at the foot of the second frontal convolution. It has other interesting features, including a reference to some observations on cortical faradization. (Author's abstract.)

5. *Contractures in Organic Nervous Diseases.*—The results were based upon a study of about 500 cases of organic nervous disease. Of this number there were 184 cases of adult hemiplegia and 32 infantile hemiplegies. Contractures may be active or passive. By passive contractures is meant a condition due to disease of the part as joint disturbances; they are mostly not due to disease of the central nervous system, in contradistinction to active contractures which always have such an etiology. The so-called early contracture of hemiplegia are not always due to a ventricular lesion. More probably the same cause which partially interrupts the continuity of the motor fibers may cause an irritation. Of course it is not to be expected that early contractures or clonic spasms could appear in a total destruction of the motor fibers. The extra-pyramidal tracts are so little developed in man that they hardly could assume an immediate function. It seems probable that if early contractures or spasms appear, the motor tracts are not totally cut off and therefore we may give a better prognosis. This is an important point, and has not before been called attention to. The variable nature of the early contractures can be explained by the fact that the irritation is abortive and is soon exhausted. Besides most of the motor fibers have been cut off and an impulse would therefore be insufficiently carried and would be diffused to irregular groups of muscles. The late contractures of hemiplegia are fully discussed. No instance was found of what could be considered a bilateral contracture due to a unilateral cerebral lesion. In five such cases considered clinically, necropsy denoted bilateral lesions. Various authors consider this condition rare. In the literature, Spiller's case is the best and was carefully studied. This was due to a congenital unilateral hydrocephalus, and the bilateral contractures were probably due to an insufficient development of the motor fibers. The conclusion can be drawn that a unilateral cerebral lesion cannot cause a bilateral contracture in an adult, and that bilateral contractures are nearly always due to bilateral cerebral lesions. The form of the contractures due to bilateral cerebral lesions seems to vary according to the nature and the time of life the injury was sustained; thus the clinical picture and the contractures differ in the cases in which the lesions occur either before or at birth, and in those in which they occur in the adult. Mostly, the contractures in such diseases are in flexion both in the upper and the lower limbs. The causes that lead to contractures in cerebral disease are next considered. The different hypotheses are discussed and the following explanation offered. If we compare the position of the contracted limbs in a hemiplegia it will be found to be identical with the position most commonly assumed when at rest. Normally there is always an excess of strength and tonicity in certain muscle groups over their antagonists, and in the return of power after an apoplectic attack this physiological relation is maintained. The best explanation for the return of function in the paralyzed limbs after a destruction of the pyramidal fibers is probably found in the influence exerted by the extra pyramidal tracts. The nature of the bilateral contractures in bilateral lesions can be explained through mechanical grounds. In a unilateral involvement of pyramidal tracts, as in a hemiplegia, the contracture in the upper limb is in flexion, in the lower limb in extension. But if both pyramidal tracts are involved all of the contractures are in flexion. There is no organic reason for this. Its occurrence can be best explained by the fact that such a patient will naturally flex his limbs because he is more comfortable in this position, especially if there be pain. Again, if the disease process is slow as in some spinal diseases the patient will make these contractures permanent.

two cases of hemihypertonia post apoplectica are recorded. The contractures in spinal cord diseases in peripheral nerve involvements and in muscle diseases are considered. Attention is called to the resemblance of the contractures found in paralysis agitans and arthritis deformans, substantiating Spiller's observation. The treatment of contractures is next considered. (Author's Abstract.)

6. *Tabes and Cerebro-Spinal Syphilis.* Two cases of cerebro-spinal syphilis are reported that, both clinically and pathologically, bore a very close resemblance to cases of tabes dorsalis; the degeneration in the spinal cord being practically confined to the posterior columns. It is pointed out that this form of degeneration would occur if the posterior roots had been compressed to the point of destruction by a syphilitic meningitis, also on account of the blood supply of the spinal cord the posterior columns would suffer severely in any process which, by affecting the meninges would interfere with the circulation in the centripetal system of arteries. In as much as the diagnosis between tabes dorsalis and these cases of syphilitic pseudo-tabes is often impossible it would be a wise measure to treat all cases in which tabes is suspected with a thorough course of anti-syphilitic remedies. (Author's Abstract.)

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11. The Abdominal Symptom-Complex in Disease of the Lower Dorsal Cord, Its Roots and Nerves. BY OPPENHEIM.
12. Subcortical Alexia with Agraphia and Apraxia. BY STROHMAYER.
13. Contribution to the Casuistry of Transcortical Motor Aphasia. BY STROHMAYER.
14. Remarks Upon Stuttering. BY MAAS.
15. The Behavior of the Axis Cylinders in Multiple Sclerosis. BY BARTELS.
16. Contribution to the Casuistry of Acute Hemorrhagic Encephalitis. BY ROSENFELD.
17. Hemihypertrophie Facialis Progressiva. BY HOFFMANN.
18. Contribution to the Etiology of Tabes, with Especial Consideration of the Relation Between Injury and Tabes. BY SCHITTENHELM.
19. Micropsia and Macropsia. BY VERAGUTH.
20. Certain Forms of Amusia, Illustrated by Examples. BY WÜRTZEN.
21. Two Cases of Hysteria Characterized by Transitory Absence of the Patellar Reflex. BY NONNE.

11. *Disease of Lower Dorsal Cord.*—Oppenheim discusses at considerable length the so-called abdominal symptom-complex. This concerns chiefly the behavior of the abdomen, and particularly the abdominal reflex in various diseases of the muscles, nerves or spinal cord which cause irregularities in the movements of the abdominal wall. His first patient had almost complete paralysis of the muscles on the left side of the abdomen, with the reactions of degeneration, and loss of reflexes on the left side. When the patient contracted the abdominal muscles the umbilicus deviated to the right. The second case, a man of fifty, had paresis of the abdominal muscles of the right side, with deviation of the umbilicus to the left, and a weaker abdominal reflex. The third case, a man of thirty-eight, had paralysis of the muscles of the left half of the abdomen, and symptoms similar to those of the first case. The diagnosis in all the cases was that of neuritis. Somewhat similar symptoms are frequently caused by tumors of the spinal cord. Oppenheim reports four cases of this condition. Two of spondylitis tuberculosa, and one of doubtful spinal syphilis. There was also a doubtful case of multiple sclerosis giving the abdominal symptom complex, one of acute anterior poliomyelitis occurring in a man of twenty-eight, and one of progressive muscular dystrophy. Oppenheim believes that the paralysis or paresis of the abdominal muscles is the most valuable element in this system group. The abdominal reflex

is of less value, chiefly because it is not constant in healthy individuals. He separates the reflex into two parts; the supra and infra-umbilical. Not infrequently one part may be preserved and the other lost without any adequate explanation for the difference. In neurasthenia and in tabes dorsalis Oppenheim has found the reflex usually increased.

12. *Subcortical Alexia*.—Strohmayer reports the case of a man forty-five years of age, who gradually developed incapacity for work. This appeared to be purely psychical. There was difficulty in associating ideas, some depression, and an intense subjective feeling of interest. There was also very serious impairment of memory, involving even the names of his own children. He was perfectly conscious of his mental deficiencies. He complained of pain in the left posterior parietal region with later tenderness in this region on percussion. There was literal and verbal paraphasia, loss of spontaneous writing and of writing to dictation. There was also complete loss of the ability to copy. The patient understood spoken words, was unable to read, but could recognize a few figures and letters correctly. There was no asteriognosia, but an inability, on the part of the right hand particularly, to use objects properly. He recognized correctly all objects held before him, and there was never hemianopsia. A diagnosis of brain tumor was made and a cyst was found in the left parietal region, about the size of an ordinary apple. This was evacuated, and eight hours later the patient died. The cyst was found to occupy a considerable area in the white substance of the left hemisphere. Strohmayer concludes that right-sided hemianopsia is a complication and not an invariable accompaniment of alexia; that alexia may be produced when the cortex and white substance of the gyrus angularis are not involved. He objects to the terms "cortical and subcortical aphasia," and would suggest the designation of isolated alexia, with or without agraphia.

13. *Transcortical Motor Aphasia*.—A man of sixty-seven, who had had an apoplectic attack four years previously, suffered from persistent disturbance of speech. He was able to understand what was said; he spoke spontaneously only when excited, which occurred very easily, or when he was questioned. He had difficulty in finding words, although his vocabulary was good. He was rarely able to name objects held before him, although he rarely used a false word. He was always able to select from a group any object whose name was given him. He could repeat words; there was paralexia, both literal and verbal; and he was unable to write the alphabet. Writing from dictation was fairly good, copying somewhat less satisfactory. At first he could read a few words and letters, but later there was absolute literal and verbal alexia. The patient had a second attack, as a result of which he died. Strohmayer regards it as a case of thrombosis followed by secondary ischemia. The two interesting features of the case were the persistence of the understanding of speech, and the fact that the patient was able to repeat a series of words fairly well.

14. *Stuttering*.—Maas discusses the various theories in regard to stuttering. In forty cases that he investigated he found an apparent hereditary element in eight. It is more common in males than in females. In nine of his cases the stuttering commenced just after a severe acute infection. Various other causes occurred so rarely that they cannot be considered important. In 40 per cent. of the cases there was a distinct deviation of the tongue when it was stretched out. In 18 per cent. of forty normal children of the same ages this anomaly was also seen. In the series of thirty-six boys, thirteen years of age, this deviation was only seen in 8 per cent. In 10 per cent. of his cases there was deviation of the lower jaw when the mouth was open. The chin-jerk was usually active, but chin clonus was never found. In two cases the chin-jerk was absent. There were slight alterations in the movements of the two sides of the face, and rather frequent facial asymmetry. After discussing various other

theories, Maas reaches the conclusions that stuttering must be regarded rather as a symptom than a disease, and in the majority of cases must be considered a neurosis.

15. *Axis Cylinders in Multiple Sclerosis*.—Bartels has made a series of longitudinal sections through the sclerotic areas in multiple sclerosis, after impregnation of the tissue with silver, according to Fajerstain's method. He finds the method more certain in its positive than in its negative results. In all areas investigated he found countless axis cylinders. Even the oldest lesions were plentifully supplied. There could be no doubt, however, that the number of axis cylinders was reduced in the affected areas, particularly the finest axis cylinders appeared to be lost. Throughout the lesions the axis cylinders were swollen and surrounded by exceedingly fine neuroglia fibers, running parallel to its course. There was no evidence of regeneration. After a comparison with Bethe's and Kaplan's methods, Bartels reaches the conclusion that the myelo-axostroma of Kaplan is destroyed in multiple sclerosis, and that the fibrillary acid of Bethe is preserved.

16. *Hemorrhagic Encephalitis*.—A man of twenty-three, at the age of nineteen, had had syphilis for which he was not treated, developed first loss of intelligence, then some days later a maniacal condition followed by increasing somnolence. There was loss of pupillary reaction, ptosis on the left side, loss of reflexes and a pulse of forty. During the coma there were clonic spasms in the right upper extremity. The patient died in coma. The autopsy showed nothing sufficient to account for the clinical symptoms. The microscopical examination of the brain, however, showed a large encephalitic focal lesion in the left internal capsule, involving the lenticular nucleus and the optic thalamus. This region was characterized by enormous dilatation of the adventitious sheathes, which were filled with round cells. There was no sign of syphilitic change in the brain.

17. *Hemihypertrophy of Face*.—Hoffmann reports a case of hypertrophy of the right side of the face occurring in a girl of fourteen years. The thickening apparently involved chiefly the subcutaneous cellular tissue. There were no disturbance of any form of sensation, or any defect in muscular innervation. The disease commenced after the age of twelve, and was steadily progressive. Altogether only six cases of this condition have been described.

18. *Injury and Tabes*.—Schittenhelm has studied 128 certain cases of tabes, with special reference to etiology. Of these, sixty-four gave a definite history of syphilis; nineteen gave a probable history of syphilis, and forty-five gave no history that would in any way point to a previous syphilitic infection. Of the sixty-nine men with a history of syphilitic infection, twenty-nine gave a history of some form of possible injury, such as severe exertion, poisoning, chilling, hereditary predisposition, and in four cases actual injury. Of the remaining thirty-three cases, eighteen gave no etiological factor at all. Fifteen gave a history of injuries similar to those in the other group. Schittenhelm then gives a brief summary of the cases reported since Hetzig's publication, in which trauma may be regarded as a contributing cause. In ten of these, traumatism was associated with some other condition. In seven cases it was apparently the sole cause. After the consideration of these cases, Schittenhelm reaches the conclusion that traumatic tabes *sensu strictiori* does not occur; rather, all cases in which tabes follows injury are to be associated with the injury only as the latter may be regarded as an assisting cause, either predisposing, or, when the predisposition already existed, developing a tabetic disease, or else causing a tabes already existing to become patent and rapidly to grow worse.

19. *Micropsia and Macropsia*.—Veraguth reports four cases of micropsia and macropsia. The condition usually occurs in the form of tran-

sient attacks. Veraguth discusses the various theories regarding the cause of this condition, and personally believes that it has its primary seat in the eye muscles, or their nervous control. These patients usually have difficulty in determining the distance of various objects.

20. *Amusia*.—Würtzen reports the case of a woman who, at the age of forty-nine, had an attack of apoplexy with complete aphasia and right hemiparesis. Following this there was complete loss of her musical sense, which had previously been so well developed that she had composed some very excellent songs. Curiously enough when she attempted to play the piano she had a complete recollection of the part for the left hand, but none of the part for the right hand. Even when she produced discords with the right hand she did not hear them, but apparently she retained her recollection of the melody. A man of forty-eight, after an apoplectic attack, also had a loss of his musical sense, and ten years later, although otherwise almost completely recovered, this defect persisted. Würtzen believes that there are various factors concerned in the integrity of the musical sense; of these the most important are (1) the recollection of notes or pitch; (2) the sense of harmony and discord; and (3) the sense of time and rhythm. He concludes with a report of two cases of congenital absence of the musical sense.

21. *Hysteria and Patellar Reflex*.—The first patient, a man of twenty-four had had hysteria for some years. He had various attacks of anesthesia, in the course of which it involved both legs from the level of the perineum. During this attack the patellar reflex at first could only be elicited by the aid of Jendrassik's phenomena; later it disappeared completely and remained absent for four weeks. There was also hypotonia. The patient was frequently observed for some time, and had various other hysterical stigmata. The second case, a man of thirty, had paresis of the muscles of the legs, with hyperesthesia for all forms of sensation and hypotonia. The patellar reflexes were diminished, and later were altogether absent, remaining so for a long period. He became insane and was transferred to the insane asylum. Nonne collects various similar cases from the literature. He surmises that in hysteria a more or less prolonged state of exhaustion of the tracts concerned in the production of the patellar reflex may occur, which causes it loss. J. SAILER (Philadelphia).

(Vol. 25, 1905, Nos. 1-4.)

1. Contribution to the Knowledge of Myotonia Congenita, Tetany with Myotonic Symptoms, Paralysis Agitans, and Some Other Diseases of the Muscles; to the Knowledge of Functional Hypertrophy and the Normal Structure of the muscles, by SCHIEFFERDECKER. With Clinical Contribution by FR. SCHULTZE.

1. *Myotonia Congenita*.—The present article, 345 pages in length, is adapted rather to a book review than to an abstract. Schultze prefixes the histories of a case of congenital myotonia, from whose deltoid muscle a large piece was removed for histological examination, the case being remarkable for the existence of Chvostek's sign; and a case of tetany with a myotonic reaction apparently secondary to a stenosis of the pylorus and dilatation of the stomach. Portions of the muscle were preserved for histological examination. It is of the results of the histological examination of those muscular fragments, and further studies that resulted from them, that the present volume is composed. Having first discussed the defects in our knowledge regarding the histology of the muscles in congenital myotonia, Schiefferdecker summarizes the results of his own investigation as follows. There is hypertrophy of the fibres; proliferation of the nuclei with the formation of long chains; a peculiar substance in the sarcoplasm that indicates a specific change in it; no indication of degeneration, either in the form of vacuoles or breaking down of the fibres; and no splitting of the fibres. Schiefferdecker next studies very minutely the histology of the muscles from a series of subjects normal or suffer-

ing from slight muscular defects, and compares them with the muscles in the case of myotonia. He has also studied the sartorius of a dog who was so trained as to develop the muscle, and reaches the conclusion that the hypertrophy produced by continuous muscular effort (activity hypertrophy) does not correspond to the hypertrophy of myotonia congenita, but that the latter is probably a peculiar change due to a disease of the sarcoplasm. Then follow 4 careful histological studies upon the muscles of 2 women dying with tuberculosis; of a woman dying with paralysis agitans, and of the second case described by Schultze.

In all 4 the muscles showed atrophy and various changes which, although interesting, do not appear to elucidate our knowledge of the disease. His histological studies suggested the following general conclusions. That the size of the muscle fibre can be influenced by the nutrition, rigor mortis, or fixation; that amitotic multiplication of the muscle nuclei frequently occurs in adults; that the form of the muscle nucleus may vary considerably either in normal or diseased fibres, and their position may even in normal cases, be within the sarcolemma. In atrophy of the muscles, Schiefferdecker recognizes a stage of simple atrophy, and a stage of atrophic degeneration. In the latter the fatty infiltration of the muscle fibres disappears. In paralysis agitans not only the muscle fibres and the fibrils are diseased, but also the muscle spindles. The muscle nerves, however, are apparently normal. The method employed in these investigations also rendered it possible to determine various numerical facts regarding the volume of the nuclei, the relation of the nuclei to the muscle mass, the total mass of the nuclei, the average diameter of the fibres, and the recognition of morbid changes in conditions in which previously none had been found. In these long articles there is a mass of histological details not suitable for an abstract, but of great interest, and presumably of great importance to subsequent workers in the field of muscular histology. Nevertheless, the amount of important new material that serves to modify or enlarge our ideas regarding disease of the muscles is comparatively small. The paper is illustrated by some excellent plates and tables, and there is also a small collection of the literature. J. SAILER (Philadelphia.)

(Vol. 25, 1905, Nos. 5, 6.)

2. The Principle of the Direction of Movements of the Organisms; A Contribution to General and Special Pathology. JENDRASSIK.
3. The Pathogenesis of the So-Called Rheumatic Paralysis of the Face. V. SARBO.
4. The Pathogenesis of the So-Called Rheumatic Paralysis of the Face, the Pupil. REICHARDT.
5. The Significance of the Pathological Anatomical Findings in the Central Nervous System in Exophthalmic Goiter. KLIEN.
6. An Attempt to Classify the Posterior Columns of the Spinal Cord. GOLDSTEIN.
7. The Symptomatology and Pathological Anatomy of Cerebral Abscess. KOLPIN.
8. Brief Communications. "A Postscript to My Article:—Two Cases of Hysteria Characterized by Transient absence of the Patellar Reflex. NONNE.

2. *Direction of Movement.*—Jendrassik attempts to solve the question of the direction of action of the various muscles by the methodical application of certain general principles. He believes that in each limb there are 3 nerves, and 6 muscles that function very similarly. The primary position is that in which the muscle is not affected either by gravity or by antagonistic muscles. It is usually a position midway between extreme flexion and extension, adduction and abduction, and with the muscle as nearly as possible perpendicular to the ground. He believes that there are 6 planes of movement for the voluntary muscles. He then discusses the mechanism by which not only the movements of flexion and extension

are controlled within certain definite limits, but also the rotation of the limb in the joint. Then follows a minute study, not only of the action of the individual muscles affecting the different joints, but also of the action of different parts of these muscles. Finally he attempts to demonstrate by diagrams the great similarity in the essential structure of the various joints.

3. *Rheumatic Paralysis*.—Sarbo reports a case of a man and his two parents the former having developed facial paralysis, first to the right, and then of the left side, and the parents each having facial paralysis on one side. In all cases exposure to cold had preceded the attack. He discusses the various theories, and believes that probably in cases of peripheral facial paralysis, especially of the familiar type, there is some deformity of the bony canal through which the nerve passes that renders it especially liable to injury.

4. *Reflex Pupillary Immobility*.—Reichardt reports the case of a man 67 years of age who had atrophy of the left optic nerve. In the early stages of the atrophy, when the patient's vision was poor in the left eye, the reaction to light was quite as good as in the normal eye. Later the reaction to light became somewhat sluggish in both eyes, but still remained equal. The left optic nerve was found flattened; the fine fibres were atrophic, but the thick normal fibres remained intact. This is merely a confirmation of the generally accepted view that the fine fibres relate to vision, and the thick fibres probably are concerned with the pupillary reactions. The sluggish pupillary reactions are probably explained by degeneration of the posterior columns in the cervical portion of the spinal cord. Reichardt also reports the case of a girl suffering from epilepsy and athetosis of the left side, with complete paralysis of the right oculomotor nerve. There was also complete blindness of the right eye, but the eye-ground was normal, and the visual apparatus merely indicated a moderate degree of myopia. Later, a complete right-sided hemianesthesia for touch and pain, without destruction of the muscular and joint senses, and without ataxia, appeared, evidently hysterical in character. It appears doubtful, therefore, whether the amaurosis is due to a focal lesion or is hysterical in character. Finally, Reichardt states that the examination of the spinal cords in a number of cases of parietic dementia leads him to believe that there is a general form of degeneration of the posterior columns of the cervical portion of the spinal cord that is associated with pupillary immobility.

5. *Exophthalmic Goiter*.—Klien reports a fatal case of exophthalmic goiter. The patient died with temperature, and after death numerous ecchymoses were found in the mucous membranes. The pons, medulla oblongata, the upper portion of the cervical cord, and one of the cervical sympathetic nerves including the lowest cervical ganglion were examined microscopically. In a region occupying the floor of the 4th ventricle and the 2 middle thirds of the pons there was an area of hemorrhagic inflammation. Numerous recent hemorrhages were found in the floor of the 5th ventricle, and the unbroken ventricles were distended with blood. The veins were filled with leucocytes. In other portions undoubted evidences of inflammation were present. Degeneration was found in the roots of the 6th to 12th cranial nerves inclusive. In the spinal cord the cerebellar tract was degenerated. Other areas of degeneration were found, including Gowers' tract. The sympathetic ganglion cells were contracted, the pericellular space widened and it usually contained several round cells. The investigation of the thyroid gland showed proliferation of the acini. Klien tabulates 36 additional cases of exophthalmic goiter in which autopsies were performed with more or less satisfactory notes. Of the 37 cases including his own, changes were found in 24. In these there were circumscribed changes in the pons and medulla oblongata in 19; in the spinal cord in 10; in the cerebrum in 6; and in the cerebellum in 3. In 3 cases the lesion was circumscribed hyperemia; in 20, recent hemorrhages; in 5, accumulation of leucocytes outside the vessels; in 3, recent degenera-

tion of the fibres and ganglion cells; in 2, old hemorrhages; in 5, atrophy of the ganglion cells and tracts; in 3, acute softening. The commonest location of hemorrhage was the floor of the 4th ventricle. Klien classifies the cases also according to the clinical symptoms, and calls attention to the fact that in all those cases in which death was apparently caused solely by Basedow's disease, definite alterations were found. He then concludes that we cannot regard these lesions as the cause of Basedow's disease, but merely as the result of the action of the poison which produces it. The changes in the cervical sympathetic ganglion are also probably secondary to the poison, but may be the cause of certain symptoms of the disease, and in this manner explain the benefit which occasionally follows the resection of the ganglia in this disease.

6. *Posterior Columns of the Cord*.—Goldstein would divide the posterior columns of the spinal cord largely according to the functions of the groups of fibres. He suggests therefore, the term "the spinal area of sensibility" for the upper and lower portions of the body. He then gives a series of diagrams which show how these areas are divided at different levels of the spinal cord, and believes that his method serves to overcome the lack of clearness in the designations hitherto employed, and enables us to understand more clearly the posterior columns. The figures are too complicated to be described in an abstract.

7. *Cerebral Abscess*.—A man of 33 developed severe pain in the left side of the head with vomiting and chills. This lasted about 2½ months. Later there was psychical disturbance, and still later paralysis of the right arm, tenderness over the left side of the head on percussion, and bilateral optic neuritis. There was no perforation of the ear-drum. At the autopsy otitis media was found, and an abscess of the left parietal lobe causing increase in the size of the hemisphere. The actual abscess cavity was small. It was limited rather closely to the white substance of the second temporal convolution, which explains the existence of a partial sensory aphasia. The paralysis was evidently due to involvement of the internal capsule. Examination of the wall of the abscess showed that it was composed almost exclusively of the connective tissue arising from the walls of the blood vessels, the glia not sharing in its formation. It contained numerous cells showing fatty degeneration. Kölpin is of the opinion that in an acute abscess formation there is rapid breaking down and solution of the tissues; that in chronic abscess formation the enlargement is due first to the secretion of pus from the membrane, second to the breaking down and new formation of the capsule. He then discusses the various forms of cells found in the tissue, particularly the plasma, the epithelioid, and the granular cells.

8. *Patellar Reflex Hysteria*.—Nonne again disclaims priority in noting the absence of the patellar reflex in hysteria.

J. SAILER (Philadelphia.)

Miscellany

A CASE OF TUMOR OF THE SPINAL CORD REMOVED BY OPERATION. BY BERNARD J. WARD. (The British Medical Journal, Oct. 28, 1905.)

The patient was a male, 24 years old. Four months after a fall downstairs, in which he struck his back, he began having intermittent attacks of pain in the lumbar region, which were diagnosed as lumbago. These attacks continued for eight years, when, in August, 1903, there was noticed a slight weakness in his legs and a few weeks later a numbness, first in the groin, but afterward extending on down the leg. By October, 1903, he had a complete spastic paraplegia with a marked hypaesthesia extending up to a line midway between the pubes and umbilicus and passing over the crest of the illicum formed the midline behind at about the third lumbar spine. There was a girdle sensation about the abdomen at this level. The Babinski sign was present. There was no incontinence of urine. At

operation the spine and laminae of the ninth and tenth dorsal vertebrae were removed. The dura bulged out as a cyst, and on incising this a tumor about the size of a walnut could be felt beneath the posterior roots. It was easily shelled out and proved to be a filio sarcoma, which probably grew from the posterior roots. The next day after operation, the paralysis, instead of being spastic, was flaccid, and the anesthesia had become absolute up to the same level as before the operation. He was relieved of his pain, but at first had retention of urine and later incontinence. Death was due to extensive bed sores, twenty months after the operation, and at necropsy it was found that all that remained of the spinal cord at the site of pressure was a strip of fibrous tissue. The author discusses the diagnosis and operability of spinal cord tumors.

C. D. CAMP (Phila.).

ANATOMY AND PHYSIOLOGY OF THE INTRACELLULAR CONDUCTION PATHS.

Arturo Donaggio (*Rivista sperimentale di Frenatria*, XXXI. 1, June 1905, p. 45).

Special methods of staining reveal the presence of fibrils in the interior of the nerve cells of vertebrates. These fibrils occupy the entire cellular body, and not only the interstices of the chromatic substance. They extend into the processes, dendritic and axonal. These fibrils are not merely juxtaposed in braids, but form a veritable network, with true anastomoses (Donaggio, Cajal, Jaris). Besides this fibrillary network there exist in the cell long fibrils which traverse the cell out to the very periphery (A. Bethe). It cannot be affirmed positively, however, that these long fibrils anastomose among themselves. Donaggio thinks that they pass through the cellular element without losing their individuality.

The intracellular fibrillary network is condensed around the nucleus—the perinuclear pad. One can trace the continuity of the axis-cylinder prolongation from the periphery of the network to the perinuclear cap. The axis-cylinder is formed preeminently by the fibrillary elements of the intracellular network, even more than by the long fibrils.

This continuity among the cellular prolongations demonstrates clearly that the fibrils are the pathways of nervous conduction. Donaggio thinks that the intracellular fibrillary network to which gathers together all the processes, probably represents an apparatus for the reception and the synthesis of the sensations. The cell, the rendezvous, as it were, of an enormous quantity of anastomosing fibrils, ought to be looked upon as an element of the highest functional importance, and not, as Bethe looks upon it, as a mere passage way for the nerve currents, represented by an absence of intracellular fibrillary network and the presence only of long peripheral and undivided fibrils.

METTLER (Chicago).

CONTRIBUTION TO THE STUDY OF THE STRUCTURE OF THE MOTOR PLAQUES.

S. Ramon y Cajal. T. iii. (viii. of the *Quarterly Review*. P. 97, 101, Madrid, 1904).

Cajal's experiments were made upon the ocular muscles of a rabbit a few days old, a pigeon and some very young birds (from four to six days after being hatched out). He employed the nitrate of silver method of staining, as it has heretofore given him such excellent results. He was led to draw the following conclusions:

1. That the staining procedure with reduced nitrate of silver may be employed in the study of the motor plates, provided one experiments with animals just born or very young.

2. That the varicosities of the terminals arborizations, as well as the extremities do not uphold the view of the development of independent fibres, but of a network with relatively large polygonal meshes.

3. That, as there exists only a terminal network (at least as an essential condition), the theory of Bethe and Nissl in regard to the functional and anatomical independence of the nerve fibres is untenable. Cajal maintains the same reserve in regard to the exclusive conducting power longitudinally of these fibres. Being given this reticular arrangement it can not be doubted but that the motor discharges scatter rather than follow the

fibres in their course; that is to say, take a path perpendicular to their general direction.

METTLER (Chicago).

PNEUMOCOCCUS BRAIN AFFECTIONS. E. E. Southard and C. W. Keene. (Journal A. M. A., Jan. 6).

The authors publish reports of twelve cases of human brain infection with the pneumococcus, together with the results of inoculation of the pneumococcus in the brains of guinea-pigs. The material in both cases was used to determine the order and time relations of the acute inflammatory changes. The cases include rather various clinical and anatomic conditions which they find only partially explained with present evidence. A long series of cases with thorough bacteriologic studies will be required to settle questions raised by the various conditions. Clinically the cases reported include fulminant and wholly obscure cases, cases not to be distinguished from severe pneumonia, otitic cases, septicemic phenomena and cases clearly cerebral or meningitic in character. Anatomically reviewed, the pneumococcus produces in man a type of inflammation in which cellular exudation and fibrin formation are prominent. The postmortem conditions found vary from focal or diffuse red softening to purulent leptomeningitis and ependymitis and occasionally abscess formation. The meningeal exudate is almost constant on the convexity, the base is frequently involved and with it the ventricles and the cord. The histologic findings are still more various. In the meninges there is a cellular exudate with varying proportions of polynuclear leucocytes and mononuclear cells. Phagocytosis on the part of the latter for the former is most marked when the polynuclear cells are outnumbered. The cell proportions in the meninges are fairly constant in individual cases. Fibrin occurs about the veins and nerve tissue. The bascular changes are characteristic lifting of the arterial endothelium by cellular exudate, proliferative changes in the intima of the veins with infiltration by polynuclear leucocytes (characteristic in large sulcal veins), and in two cases there was mural thrombus formation in the veins. Seven cases out of the twelve showed increase or other change in the neuroglia, especially of the subpial layer. The cortical tissue is almost invariably penetrated by polynuclear leucocytes. Orbital inoculations in guinea-pigs gave different results with different cultures. The usual but not constant tendency when positive results are obtained, is to the production of exudates with a high proportion of mononuclear cells of the phagocytic series. The exudation of polynuclear leucocytes, however, is primary and may be noted in six hours. The exudate is at its height in five or six days, and leaves no trace after from two to five weeks. Ependymitis and encephalitis are not prominent. As a rule, the guinea-pig inoculations produce no clinical sign. Other methods of inoculation were not so satisfactory for the study of the pneumococcus. The article is illustrated.

Book Reviews

KRIMINAL-PSYCHOLOGIE. VON DR. HANS GROSS, Professor des Strafrechts an der Deutschen Universität, Prag. Zweite Auflage. F. C. W. Vogel, Leipsig.

Dr. Gross is a prolific writer. Those who follow his well-known *Archiv für Kriminal Anthropologie* may well wonder concerning the source of the energy and enthusiasm that he puts into that interesting publication.

We have had occasion to comment on the *Kriminalistische Aufsätze*, which was recently published by the same author, and now comes the second edition of 710 pages of the *Criminal Psychology*, and this is only a part of a much more extensive program as outlined in his introduction.

The general scope of the work is different from many others. He divides it into two parts. In the one, *Subjective*, he discusses methods of observation, the natural history method of induction, general phenomena. Under the *Objective* portion of his book he takes up the psychic activities of the examined. Here general physical activities are described and discussed, as well as differential and separating manifestations. Thus differences in men and women make a chapter, children and their psychic manifestations, another, the cultural variations another.

The size, scope and character of the work preclude a detailed analysis in this place. It is to be regretted that practically nothing exists in English covering the ground that is worth anything. Until our jurors grow to the needs, or are awakened to a desire for a more thorough understanding of the psychical activities of mankind, excellent books of this type find a limited use where they are most needed.

JELLIFFE.

LEITFADEN DER ELECTRODIAGNOSTIK UND ELECTROTHERAPIE FÜR PRAKTIKER UND STUDIERENDE. By DR. TOBY COHN, Berlin. S. Karger, Berlin.

The work of Dr. Toby Cohn in electrodiagnosis and electrotherapeutics is too well known to need an introduction to those interested in the employment of electricity medically. The first part of the book, after discussing the nature of the electric current and its effect on the tissues, deals with the methods of examination and the changes in electrical reaction of the muscles and motor nerves. There is also a chapter on the electrical examination of the organs of special sense and on the electrocutaneous and electro-muscular sensibility. The explanations throughout are clear and concise and the directions for examining the electrical reactions leave little to be desired.

In the second part, the first chapter treats of the general principles of electro-therapeutics. Successive chapters deal with the employment of the galvanic and Faradic current in the treatment of various diseases. Chapters are added on the use of "Franklinisation," or static electricity, "Telsaïsation," or the high frequency current, and also on the newer forms of electricity the sinussoidal undulatory and triple phase currents. In therapeutics the general tone is conservative, and no extravagant claims are made as to the universal usefulness of electricity. The same clear directions are given for treatment as for diagnosis, and there is no doubt that if these were followed the results would be much better than are obtained by the ordinary haphazard methods too frequently employed by the average physician. In this, the third edition, the tables showing the irritability points of muscles and nerves have been revised. Recent advances in the subject have been incorporated in all parts of the book and a special chapter added on the management of the galvanic and faradic apparatus which will be of great practical value especially to beginners.

C. D. C.

TRAITE DE MEDECINE.—Par M. M. BOUCHARD ET BRISSAUD. Deuxieme Edition. Tome X. Par M. M. J. BABINSKI, GILBERT BALLET, P. BLOCO, E. BOIX, H. DUTIL, H. GRENET, HALLION, H. LAMY, CH. LAUBRY, H. MEIGE, ROGUES DE FURSAC and A. SOQUES. Masson et Cie, Paris. Paul Hoeber, New York.

Some years ago we had the opportunity of commenting on the first edition of this valuable system, volumes IX and X of which were concerned with the discussion of the diseases of the nervous system.

To those readers who are accustomed to finding a second edition a replica of the first, with a few new pages added, or some trifling errors of typography corrected, it may be of interest to compare the methods of French publishers in the matter. It is refreshing to note that the work is an entirely new one, rewritten and almost double the size of the previous volume.

Volume X deals with Neuritis, by Babinski; Diseases of Muscles and Motor Nerves, by Hallion; the same author treats of Anesthesias and Neuralgias. Henri Meige writes the chapter on Tics, and Functional and Occupation Neuroses. Chorea and Myoclonus, by Blocq and Grenet; Thomson's Disease, by Hallion; Paralysis Agitans, by Lamy. E. Boix contributes a chapter on the various myopathies; A. Soques one on Acromegaly, Myxedema and the Metabolic Disorders. Exophthalmic Goiter and the Sympathetic are written by Boix. Hysteria, Neurasthenia, Epilepsy, are treated by Dutil and Laubry. Ballet contributes a chapter on the Psychoses in General, while with Rogues de Fursac he writes the chapter on General Paresis. A general index of the ten volumes is also included in this volume.

As one of the leading systems of modern French authorities this volume is representative of the best work of the most competent French neurologists and psychiatrists. It is a representative work of the highest order.

JELLIFFE.

DIE PALPABLEN GEBILDE DES NORMALLEN MENSCHLICHEN KORPERS UND DEREN METHODISCHE PALPATION. NACH EIGENEN UNTERSUCHUNGEN AN DER LEICHE UND AM LEBENDEN. Von Dr. Toby Cohn, Nervenarzt in Berlin. I. Teil: Obere Extremität. Mit 21 Abbildungen im Text. Berlin: Verlag von S. Karger. 1905.

This book, in the words of the author, has its origin from his practice of massage. After twelve years' work in this line, he has reached the conviction that, were the normal conditions of the body better known, much might be accomplished toward detecting abnormalities capable of being palpated. He has, therefore, prepared a book, the first part of which on the upper extremity is in our hands, which goes over in minutest detail the knowledge to be gained through palpation. The author maintains, and we think with reason, that palpation has been neglected in medical practice, particularly in relation to the muscular structures and the parts immediately underlying them. The value of knowledge which might be gained by more extended experience in this field is evident, and Dr. Cohn has placed such knowledge at our disposal in his exhaustive treatise on the subject. It is evident that such a subject is not to be learned from books. Nevertheless, as a guide to the student the directions he lays down and the descriptions he gives are of distinct value. We are of the opinion, however, that condensation might well have been used and that illustrations might have taken the place of much descriptive text. The illustrations are not half satisfactory, according to our modern standards. The half tones are printed in the text, the model used does not show the points desired so well as a more muscular man would do, and the necessarily imperfect printing on ordinary paper likewise detracts from their appearance. The book is otherwise well printed,

conveniently subdivided into the various topics discussed, and in general offers a mass of information which has not hitherto been collected in such a form. We shall await the succeeding parts with interest.

LES CENTRES NERVEUX PHYSIOPATHOLOGIE CLINIQUE. Par le Docteur J. Grasset, Professeur de Clinique Medicale a l'Université de Montpellier. J. B. Bailliere et Fils, Paris. P. Hoeber, New York. 12 Francs.

This is in many respects a unique book. We are all familiar with the usual text book which is largely anatomical in its point of view. Grasset has, however, given us a pathological physiology, in much the same sense as Krehls, *Pathologische Physiologie*, but has confined his dissertation of 730 pages to the nervous system.

Thus his chapter headings read as follows: The Central Nervous Apparatus of Motility and of General Sensibility; The Central Nervous Mechanism of Orientation and Equilibration; Language and its Nervous Mechanisms; Vision, Taste, Touch, Smell and their Central Nervous Mechanisms and the Nervous Mechanism of Nutrition, of Circulation, Secretion, Trophic Sensibility, Digestion, etc.

He develops each chapter in a leisurely manner, at times with great minutiae, at others, he simply suggests the nervous relations to certain pathological processes, nervous mucous colitis being an example. This makes the work somewhat irregular and unequal, but it is rich in suggestions, and full in bibliographical references to more detailed study of many of the features simply touched upon by himself.

SUPERSTITION IN MEDICINE. By Prof. Hugo Magnus. Authorized Translation from the German. Edited by Dr. Julius L. Salinger, Late Assistant Professor of Chemical Medicine, Jefferson Medical College, Physician to the Philadelphia General Hospital, etc. Funk and Wagnalls Company, New York and London.

This little volume, treating as it does, of a subject so interesting to the educated man; can not help but be appreciated by the physician. Prof. Magnus has portrayed his subject so interestingly, so concisely and so scientifically that the subject, engaging in itself, is made even more so.

The chapter on the Relation of Religion to Medical Superstition, which covers the subject from the ancient medicine of the "Magi" to the present day cults of Mrs. Eddy and the Rev. Mr. Dowie, shows clearly the origin of many of the numerous superstitions that are, even now, so deeply rooted in the public mind.

The other chapters on the Relation of Theism, Philosophy, Science and Medicine itself respectively to Medical Superstition, each have their hold on the interest of the reader. The last chapter on Medical Superstition and Insanity, added by Dr. Salinger, lends much to the interest of the book. The few hours required to read this little volume would be time well spent even by the busiest practitioner. L. CASAMAJOR.

THE
Journal
OF
Nervous and Mental Disease

Original Articles

THE CARE OF THE INSANE AND THE STUDY OF PSYCHI-
ATRY IN GERMANY.

BY STEWART PATON.

To attempt to compare the methods employed in Germany for the care of the insane and in the study of psychiatry, with the methods prevailing in America involves certain difficulties of a fundamental character which cannot be easily set aside. In entering upon discussion of this matter, however, obvious truths present themselves which are worthy of remark and careful consideration.

The written and verbal opinions of German physicians and public-spirited laymen who are interested in such practical questions as the housing and care of the insane, as well as in the solution of the problems relating to the investigation of the course, termination and prevention of insanity, are stamped by a spirit of optimism.

This feeling of hopefulness which is justified by the favorable conditions under which German alienists are working to-day is accentuated by their appreciation of the fact that in no other department of medicine is a more carefully planned and determined effort being made to solve important scientific problems than in the field of psychiatry. Abundant evidence in confirmation of this statement is afforded when attention is called to the large sums appropriated in Germany for the erection and equipment of clinics, hospitals, asylums and laboratories and the liberal provisions made for the prosecution of scientific investigation. An enlightened public spirit realizes the fact that the simultaneous development of the practical and scientific departments is absolutely essential to secure the greatest and best results. Bavaria, with a population considerably less than that of New York State, affords

a striking example of what has actually been accomplished. At Erlangen and at Wurzburg there are psychiatric clinics and hospitals and at Munich the latest and, beyond doubt, the best hospital of its kind in the world has been erected at a cost to the city for buildings alone of over \$500,000.*

To be classed with the institutions above named is the receiving ward for cases of mental diseases connected with the Nuremberg General Hospital. Two other asylums are approaching completion, one at Haar near Munich (at a cost of \$2,000,000) and one at Ansbach with accommodations for about 300 patients.



Entrance Hall to New Psychiatric Clinic at Munich.

When careful consideration is given to the construction and organization of these institutions, the apothegm, "Science is but organized common sense," is emphasized in the most striking manner. Even casual observers will be convinced of the wise extravagance exhibited in providing for the accommodation of patients.

* A bill has been passed by the New York State Legislature appropriating \$300,000 for the erection of a reception hospital in New York City to accommodate 200 patients. When allowance is made for the greater cheapness of labor in Munich, it will be seen that in round numbers practically twice the sum has been expended in furnishing and equipping the Bavarian institution which has accommodations for only 110 patients.

More impressive, however, than the testimony of bricks and mortar is that fact that the movement, having for its objects the care of those already afflicted with mental disorders and attempting to limit the spread of insanity is part of a carefully considered plan dominated by the idea that a great deal more can be done for the insane than by merely increasing hospital or asylum accommodations.

The most impressive feature of the general plan referred to is the liberal, not to say lavish, expenditure of money for the con-



Library in New Psychiatric Clinic at Munich.

struction of psychiatric clinics. These institutions fulfill the double purpose of fostering the spirit of scientific investigation and make possible a solution of many practical questions connected with the actual care and treatment of patients. Important testimony as to the good that may be accomplished by such agencies is contained in the last annual report of the New York State Charities-Aid Association from which the following passage is quoted:

“The supreme advantage of the proposed reception or psychopathic hospitals, will consist not alone in their superior scientific equipment, their eminent consulting physicians and surgeons and their staff of trained internes, but also in what they will stand for to the public.”

Authorities in Germany are agreed that, in order to save expense to the State, clinics should be built before complete provision is made for the care of patients in asylums; as an experience of forty years has shown that the presence of these clinics in a community changes the types of cases that apply for admission to an asylum. As the asylums receive a large number of patients from the clinics, the phases of disease admitted to the former have become radically different since the psychopathic hospitals were first established. Asylums in countries where no Psychiatric Clinics exist must be constructed and equipped to meet different



Ward in Clinic.

conditions from those existing where this type of hospital is found. In Germany there is a marked tendency to facilitate in every possible way the admission of patients to the clinics, and through them into asylums. Prof. Fürstner in referring to this subject has redirected attention to the fact that the most humane laws in regard to the commitment of the insane are to be found in those districts where formerly the old French statutes (the logical outcome of Pinel's teaching) serve as models for present-day legislation. In spite of occasional misstatements by the press which too often distorts facts and seeks to excite public sentiment against the retention of patients, cases of individuals wrong-

fully deprived of liberty do not occur. At the clinics, patients may be held in the discretion of the medical director for a sufficient time in which to make a complete examination of their mental status, then should they still continue to object to being confined they can appeal to the court which appoints an independent committee of investigation whose decision is final.

The subject of the relation of clinics to universities and the duties devolving upon professors of psychiatry deserve more than a passing mention. With hardly an exception the psychopathic hospitals are all in university towns or cities and are as closely affiliated with the university as are the medical or surgical clinics.



Pathological Laboratory of Clinic.

As a general rule to which there are but few exceptions, the most advanced and experienced teachers in medicine are found among that class of men who are brought into close contact with the work done in the various departments of the university, and this rule applies with equal force to alienists. It is generally admitted that the view not infrequently expressed, viz.: that it is possible to obtain men skilled as clinicians or as laboratory workers if liberal salaries are paid by the university, needs to be qualified. Unless a department of psychiatry is organized so as to attract men who are engaged in research in other branches of bi-

ology, there will not be sufficient intellectual pleasure in the character of the work to induce men of originality in thought or painstaking workers in laboratories to devote their lives to the study of psychiatry.

The mere mention of the questions that are constantly asked of the alienist, such as, for example: "What is the nature of a reflex?" "What are the problems of consciousness?" "How are impulses conducted?" have shown our German colleagues the necessity of having the physiological, psychological and biological departments of the university bear more than a nominal relationship to each other, and, indeed, the affiliation of clinics and universities is an essential factor in keeping alive that spirit to which



Ward in Clinic.

Frederick the Great gave expression in a letter to Voltaire: "The keenest pleasure a reasonable man can experience is to discover a new truth." The duties devolving upon professors of psychiatry indicate the importance of the subject as viewed by German university authorities. The alienist is a member of the university faculty and as such is required to devote a very considerable portion of his time to his university duties. It is the rule and not the exception for a professor to devote five or six hours daily to work in the laboratory and hospital wards, and one or two hours in the afternoon to "consultations." It is not difficult to sav

whether the students and the universities are likely to derive more good from such a division of time than they would were the professor to give the best hours of the day to his private practice and the brief remaining time to visiting hospital wards, to occasional visits to the laboratory and to the perfunctory delivery of more or less stereotyped lectures. The fact that the clinic is directed by a single head and that there is no "divided service" makes it possible for the carrying on of investigation extending over a very considerable period of time, a condition for the suc-



View of Buildings of New Psychiatric Clinic at Munich.

cess of which, on account of the nature of the problems to be studied, is even more desirable in psychiatry than in any other clinical branch.

Another very important feature of the German system is that the vacancies occurring on the staff are not necessarily filled by members of the same clinic, but often by the members of the staff of some other university. This constant exchange of men and resultant exchange of ideas that is going on all over Germany is of the greatest importance to the maintenance of the high standard

of productive work done in German clinics. There is little or no "in-breeding" and when a vacancy occurs in the medical staff of one of the clinics, the appointment is generally and of purpose given to the professor or assistant from a different university. Considerable surprised comment was made over a recent appointment where the first assistant in one of the clinics was promoted to full professorship. In this particular instance, however, the promotion was well deserved. "A great danger has always existed," said a recent German critic in referring to the duties devolving upon the occupant of a professorship, "lest the powers conferred be too unrestricted," and certainly this fear is not groundless. In America professors and heads of clinics are not appointed as they are in Germany, by the governing board of the university, the membership of which is constantly changing, but by self-perpetuating boards of trustees, whose chief and only desire, very often, is to have the "wheels of the machine run easily."

Although the German methods of organization may occasionally reflect the disadvantages of constitutional monarchy, the American methods may, if eternal vigilance is not exercised, assume the form of absolutism.

If common-sense business methods, a sense of patriotism and a true feeling of democracy are the guiding principles of those whose duties it shall be to organize the first university psychiatric clinic in America, the future of psychiatry will be bright. To one who seriously considers the national importance of these clinics, there can be little doubt that state authorities as well as private benefactors will soon make it possible to establish in the United States, under university control, a number of institutions whose purposes may be briefly summarized as follows:—

1. The cure of many patients who now become hopelessly insane.

2. The instruction of medical students as well as practicing physicians in psychiatry so that eventually there may be found in the community a greater number of men who are competent to advise whether an individual is capable of standing the mental strain imposed by special forms of education or is able to endure the nervous strain of the environment in which the individual lives.

3. The possibility of keeping under observation a large num-

ber of individuals whose unstable nervous systems may, if occasion presents itself, become sources of danger to the individuals themselves or to the community.

4. The examination of cases in which the question of mental responsibility is under debate and a submission to courts of formal reports based upon observation to supercede the hypothetical "expert evidence" that so frequently is a parody of justice.

5. The study of all problems whose ultimate solution will lead to a more comprehensive understanding of the functions of the brain with a view to determining the most efficient methods of increasing the number of individuals in the nation who are capable of rational thought and action.

DISPENSARY WORK IN NERVOUS AND MENTAL DISEASES.¹

BY SMITH ELY JELLIFFE, M.D., Ph.D.,

OF NEW YORK,

VISITING NEUROLOGIST CITY HOSPITAL, NEW YORK. MEMBER OF CONSULTING STAFF OF MANHATTAN STATE HOSPITAL; CLINICAL ASSISTANT, DEPARTMENT OF NERVOUS DISEASES, VANDERBILT CLINIC, NEW YORK.

THIS report for the year 1905 of the neurological service at the Vanderbilt Clinic constitutes the fifth consecutive year that these reports have been prepared and it is believed that they will, if continued from year to year, constitute a valuable series for comparative studies in the incidence of certain forms of nervous and mental disease.

It is doubtful if, with the present system of city government, a general clinic of the type of the Vanderbilt Clinic will ever offer a fruitful field for the study of mental disorders. This is definitely so with reference to those in which the psychosis which develops brings the patient in conflict with the authorities. For the milder grades, however, it is not improbable that much help can be offered by the clientele of such a clinic, if the inevitable crowding of our out-patient department might in some manner be ameliorated and a little more quiet and seclusion offered.

During the year 1905 the number of patients sent to the neurological department exceeded that of the previous year. They numbered 2,284, of which number 2156 were examined by the clinical assistants in service.² The number of examinations made shows an increase over those of the past year.

As in the previous years it has been found that the percentage of nervous and mental disease to the general clinic population has remained about the same, the figures for 1905 kindly given to me by Mr. J. V. Colgan being as follows:

	Patients	Visits
Nerves	2284	9521
Orthopedic	1018	6861
Surgical	4575	21600

¹Report of service of Dr. M. Allen Starr for 1905.

²Richard H. Cunningham, Chief of Clinic; Chas. E. Atwood, B. E. Krystall, Smith Ely Jelliffe, S. P. Goodhardt, E. L. Hunt, L. P. Clark, L. S. Munson, H. R. Humphries, J. M. McEntee, Thos. P. Prout, Geo. W. Todd and J. E. Clark.

Medical	14026	43520
Children	3723	9888
Women	2772	10177
Eye	4721	13967
Ear	1637	6170
Throat and Nose	4279	13091
Skin	3745	11325
Genito-Urinary	2575	10672
	<hr/>	<hr/>
	43355	156792

The total number of visits for the year was 9521. Thus the average per person stays about the same as for the 5 years past.

Of the 2156 patients who applied for treatment in 1905 it was found that 106 men and 51 women, 157, were not suffering from any nervous disorder, making a total of 1999 patients suffering from nervous disease in a clinic population of 43355. The average of 5 per cent. of general incidence of nervous and mental disorders also remains as in previous years. In this connection it may be recalled that the average of mortality from diseases of the nervous system from the vital statistics of the United States for 1900 was 11 per cent.

In 82, 37 men and 45 women, a diagnosis was not entered in the case histories. The cause for this is not far to seek in view of the transient service sometimes sought. This leaves a total of 1917 patients from whose histories the following statistical information may be obtained:

Mental Diseases.—The statistics of 1905 confirm the general average of ten per cent. of mental cases observed during the past 5 years. There were 194 patients who showed some type of mental involvement, of which 95 were men and 99 women.

The early developmental defectives represented the larger proportion of these cases, 73 in all, or 37 per cent. of the mental cases—3.7 per cent. of the entire nervous disorders. Of this number, 11, 9 boys and 2 girls, were classed as IDIOTS, while 62, 32 boys and 30 girls, were grouped as IMBECILES of various grades. The great disparity between boys and girls noted in last year's study is not present in this year's review.

Following the broad classification of the insanities proper as outlined in the previous reports, and reiterating our statement

that the diagnosis of the general type of insanity must be accepted in a general sense, the figures of 1905 offer nothing striking. TOXIC PSYCHOSES were recognized in two instances, 1 male and 1 female. Alcohol was the chief factor in one; the puerperium in the other.

The DEMENTIA PRÆCOX SYNDROME was diagnosed in 15 cases, or about 7.7 per cent. of the mental cases; omitting the defectives, the dementia præcox cases represented about 12 per cent. of the mental cases, a proportion strikingly suggestive when compared with the records of the Kraepelin schools and with Dr. Gregory's service at the Psychopathic Ward at Bellevue.

MANIC-DEPRESSIVE STATES were diagnosed in 14 instances, 6 men, 8 women; in only about half of these was the history sufficiently exhaustive to support the diagnosis.

INVOLUTIONAL MELANCHOLIA of Kraepelin was entered as occurring in 14 patients, 3 men and 11 women. In these figures is seen the general tendency to follow the teaching of the Kraepelin school, and to limit the number of cases of melancholia, pure and simple.

PARANOIA or PARANOID STATES were represented this year by four patients only, one man and three women.

GENERAL PARESIS was diagnosed in 33 patients, 3 of whom were women. Thus of the diagnoses this year of mental disease, 28 per cent. were of paretics.

The general features surrounding the early paretic are such that relatively larger numbers are brought to a clinic of this type; the average therefore of paretics to other insane individuals is relatively much higher.

Unclassified DEMENTIA was present in 6 men and one woman. Mixed and undefined psychopathic states, mostly to be classed as among the Psychoneuroses, were present in 40 individuals. The larger number, 36, were women, and the menopause was the important etiological factor in determining the mental changes. Thus there were 29 MENOPAUSE PSYCHONEUROSES, 4 PATHOLOGICAL CHARACTERS in nervous children; 3 marked neurotic women, and one man with obsessional, psychasthenic symptoms.

Nervous Diseases.—Under this rubric 1723 patients are classified, or about 87 per cent. As in previous years the so-called sensori-motor neuroses are more commonly represented than other

types of nervous disease. In 1905 there were 393 patients, 20.5 per cent. diagnosed as NEURASTHENIC; of these 248 were men and 145 women. As in former years foreigners preponderated greatly among the neurasthenics, the Russian Jew being greatly in evidence. It should be said that the general clinic patient who comes complaining of everything in general and little in particular, is put down as neurasthenic. There is little doubt that if two of the clinical assistants should devote themselves entirely to the so-called neurasthenic cases, much valuable symptomatology could be obtained, but in the hurry and bustle of the work these patients are not very carefully investigated. When the difficulties due to the various foreign languages that these people speak are borne in mind it is not to be wondered at that a so-called functional case is not over interesting. The fact remains that for both men and women the faculty of being discontented and complaining is highly developed in these patients.

The diagnosis of HYSTERIA may depend in large part on the individual investigator. It is not improbable that what is called hysteria in women is put down in the history books as neurasthenia in men. This year's statistics yield 106 patients, 5.5 per cent. with a more or less pronounced hysterical temperament, 8 men and 98 women. Major hysterical attacks are not recorded for many of these patients. The more characteristic stigmata, aboulias, paralyses, anesthetics, are recorded in less than 10 per cent. of the cases at the time of examination.

Some very interesting hysterical patients are seen from time to time. Hysterical paraplegia is entered upon the records, and one old case of hysteria resembling multiple sclerosis is recorded. One patient with a partial hemiplegia is entered, in which the hysterical basis seems very highly probable.

EPILEPSY is represented in 156 patients, 104 males and 52 females. Most of these are in children, and are often associated with the characteristic hemiplegic and diplegic characters of many of the patients. This year's great preponderance of boys is probably accidental.

The SYDENHAM CHOREAS in 1905 were less than in 1904, 141 patients, 7.5 per cent., only coming to the clinic, of which 44 were males and 97 females. The preponderance of this disease in girls is very striking in the five years during which these statistics

have been gathered. It would be of interest to observe if the curve of the choreas rose and fell with the curve of infantile rheumatisms. I am unable to obtain any statistical inquiries in pediatric clinics that would offer any suggestive comparisons.

In my report for 1904 I suggested that one in 200 children suffered from chorea if one could follow the statistics of the Vanderbilt Clinic as an average for the general population. I believe that this computation is too high, for it may be fairly well assumed that rheumatic conditions are much less prevalent among the better classes and that the secondary choreas would therefore be represented out of their due proportions in the following of the Vanderbilt Clinic.

In a report of the N. Y. Post Graduate Clinic of Dr. J. Collins (Post Graduate, May 1905, pp. 578-583) Miss Hedwig Hoefle presents a summary of the cases of nervous disease observed from 1897 to 1904 inclusive. In this service there were 325 cases of chorea in the eight years, 135 males, 187 females. The total number of patients treated in these years was 6350, thus 5 per cent. of the cases of nervous disease treated in the Post Graduate suffered from chorea. Our percentage is 7.5 per cent.; thus from general considerations and one statistical source it may be inferred that our calculation is somewhat high. I hope to return to this question when a report for five years shall have been compiled, and brought into correlation with other iniquities in European out-patient departments.

This year's report shows 13 TIQUERS, 5 males, 8 females. SPASMODIC TORTICOLLIS is diagnosed in 2 men and 5 women, while in twelve patients various ill defined convulsive anomalies are recorded.

PARALYSIS AGITANS is entered in the records as being present in 16 patients, 15 men and one woman. This is a high percentage among the men. The youngest patient was 42 years of age at the time of onset.

Peripheral Nerve.—The Vanderbilt Clinic offers an exceptional opportunity for any student who would seek a knowledge of peripheral nerve affections. Of Neuralgias, Neuritides and Paralyzes no less than 324 patients, 184 men and 140 women, were treated in 1905. This is within 10 of the total number for 1904.

The NEURALGIAS were present in 158 patients (7.7 per cent)

69 men and 89 women. These were distributed in general as follows:

	Male	Female
General and Non-localized	81	4
Occipital	3	1
Supraorbital	7	14
Infraorbital	1	0
Trigeminal	17	45
Cervical	3	1
Deltoid-Brachial	1	10
Lumbar	7	3
Sciatic	32	11

As has been outlined in this report in a previous year the line of demarcation between the neuralgias and the neuritides is not always easy to draw. The presence of a sore nerve trunk is often unfound or even unlooked for—with this general statement our figures show 56 patients suffering from a NEURITIS, not sufficiently severe to develop a distinct paralysis. Tabularly expressed these are variously grouped in the history books—the etiological factor predominating in the statistics.

	Male	Female
Alcohol	4	1
Ant. Tibial	3	0
Brachial	1	5
Brass	1	0
Lead	6	3
Not localized nor cause given	4	4
Pneumonia	1	0
Septic-Puerperium	0	1
Syphilis	1	2
Toxic (?)	0	1
Traumatic	3	0

PERIPHERAL PALSIES were observed in 110 patients (5 per cent) 78 men and 32 women. The distribution was as follows:

	Male	Female
Erb's	5	9
Facial	24	15
Brachial	10	2
Musculo-Spiral	35	3

Circumflex	6	0
Deltoid	3	0
Ulnar-Median	4	0
Sacral	0	1
Trapezius	0	1
Third N.	0	1
Eye nuclear, Syph.	1	0

Thus it may be seen that the facial and the musculo-spiral are the nerves most frequently involved.

Spinal Cord.—Speaking in a general sense only the spinal cord affections were present in 111 patients, about 5 per cent.

The ANTERIOR POLIOMYELITIS SYNDROME was present in 36 patients, ACUTE ANTERIOR POLIOMYELITIS being diagnosed in 31, 12 males and 17 females. CHRONIC ANTERIOR POLIOMYELITIS was diagnosed in 5 men. There were no patients with involvement of the higher motor homologues.

AMYOTROPHIC LATERAL SCLEROSIS was present in one patient only, while MULTIPLE SCLEROSIS was present in only 4 instances this year, one male and 3 females. This is a comparatively small number of cases of this disease for the year.

POSTERIOR COLUMN SCLEROSIS (TABES) was present in 39 patients, 35 males and 4 females. FRIEDREICH'S DISEASE was present in one boy. LATERAL SCLEROSIS was present in 5 men and 1 woman. COMBINED SCLEROSIS was present in one woman.

MYELITIS was diagnosed in 6 men. A number of diffuse cord lesions, all in men, were present, thus there were 3 Fractures, 2 Gummata, and one Gunshot wound. SYRINGOMYELIA was diagnosed in 3 men, and HEMATOMYELIA in 2 men.

MUSCULAR DYSTROPHIES were present in 2 males and in 4 females: they were all of the Pseudohypertrophic type.

Brain Lesions.—These were present in 94 patients, 4.8 per cent. Epidemic Cerebrospinal Meningitis was diagnosed in 4 patients, 2 males and 2 females.

INFANTILE CEREBRAL PALSY was present in 17 cases, 4 males and 13 females.

The HEMIPLEGIC SYNDROME was present in 49 instances, 40 in men, 9 in women. No attempt was made accurately to locate the site of this lesion in the great majority of cases, nor were enough localizing signs entered in the histories to enable the compiler to

analyze them any further. MONOPLÉGIA was diagnosed in one male, and MOTOR APHASIA in 1. CEREBRAL GUMMA is put down for 5, Cerebral Tumor 6, 2 in males, 4 in females; CEREBELLAR TUMOR was present in 1 woman. CEREBROSPINAL SYPHILIS was diagnosed in 3 males, and CEREBRAL CONCUSSION in 2. Post-Traumatic ATHETOSIS is diagnosed in 1 woman. CEREBRAL ARTERIOSCLEROSIS was thought to account for the patient's symptoms in 12 men.

Trophoneuroses.—These were represented by RAYNAUD'S DISEASE in 1 man, ANGIONEUROSIS in 3 women, MYXEDEMA in 1 man, ARTHRITIS DEFORMANS in 1 woman. EXOPHTHALMIC GOITER in 10 women. In 2 others a goiter was present unattended with the sympathetic syndrome involvement. ACROPARESTHESIAS were present in 4 men and 13 women.

Miscellany.—ALCOHOLISM, 33 men, 6 women; TEA DRINKERS, 2 women; MORPHINISM, 1 woman; TOBACCO, 1 male; HEADACHES, 32 men, 56 women; MYASTHENIA gravis, 1 woman; TREMOR, 4 men, 6 women; NIGHT TERRORS, 3 boys, 2 girls; ONANISM in 2; MENIÈRE'S complex in 3; PARESTHESIA in 3; INSOMNIA in 17; TETANY, 1; STAMMERERS, in 13 boys, 9 girls. 1 SENILE case and 1 with ENURESIS and 2 MUSCULAR RHEUMATISM.

TUBERCULOUS MENINGITIS, WITH REPORT OF 52 CASES.*

BY J. N. HALL, M.D., AND S. D. HOPKINS, M.D.,

OF DENVER, COLO.

We report to-day 52 cases of tuberculous meningitis seen in Colorado. Fifteen of these were taken from the records of the County Hospital, most of them having been under the care of one or the other of us. The remaining 37 cases were seen by us, almost equally, in our private and consultation work.

The study has been chiefly a clinical one since post-mortem confirmation was possible in but four instances. The diagnosis has been based upon the classical symptoms of this disease, and it is to be noted that the usual and inevitable termination occurred in all. It was not thought necessary nor advisable to perform spinal puncture in the cases reported. Unfortunately, the records are incomplete as to many of the symptoms, chiefly because more than half the cases were seen but once or twice by one of us in consultation. Many of the symptoms noted might have been differently recorded could we have followed these changeable cases throughout the course of the disease.

Of this number the great majority, 40 out of 52, occurred in male subjects. One occurred at $3\frac{1}{2}$ mos. of age, five between 2 and 5 years, eight between six and ten years, six in the second decade, eleven in the third decade, twelve in the fourth decade, six in the fifth decade. In three the ages are unknown.

It is very striking to note, doubtless owing to our large imported tuberculous population, that 29 cases occurred after 20 years of age, and only 20 under that age. Gowers mentions the great frequency in children between the ages of 2 and 10, and states "that it is not rare in early adult life, but scarcely ever during the later period."

Fourteen of our cases were in the first decade of life, about 27 per cent. We find that nine of these cases were in children under the school age, five in those attending school. There were four housewives, and practically all the remainder gave some indoor occupation.

*Read before the Colorado State Medical Society, Oct. 5, 1905.

Nine were natives of Colorado, largely the children of tuberculous parents. One of our patients was colored.

The duration of residence in Colorado, in those not natives, was given in nine cases as follows: 37 yrs., 18 yrs., 16 yrs., 10 yrs., 6 yrs., 5 yrs., 4 yrs., 2 yrs., 1¼ yrs. In every one of those who had resided in the State for a period of over 4 yrs., there was a history of pulmonary tuberculosis before coming here.

In eleven cases there was a history of at least one death in the family from tuberculosis, one of these deaths having been from tuberculous meningitis in a boy of 7 years. In three instances two of the family had died of tuberculosis, in two instances three, and in one instance six.

As to the history of preceding tuberculosis we have obtained the following facts: History positive but location of disease unknown in 15 cases; right lung involved in 6 cases; left lung involved in 4 cases. Abdominal tuberculosis was also present in one of the above cases.

In one case large tuberculous bronchial glands were detected, and the child died within a few weeks of tuberculous meningitis. This child had had during the preceding summer a tuberculous nurse for several weeks unknown to its mother.

In another child the tuberculous meningitis followed shortly after a severe attack of whooping cough.

The duration of the disease was as follows: 90 days in 1 case, 54 days in 1 case, 30 days in 1 case, 21 days in 1 case, 20 days in 3 cases, 18 days in 1 case, 17 days in 3 cases, 16 days in 1 case, 15 days in 3 cases, 14 days in 3 cases, 12 days in 4 cases, 11 days in 2 cases, 10 days in 2 cases, 9 days in 1 case, 8 days in 4 cases, 7 days in 4 cases, 6 days in 5 cases, 5 days in 6 cases, 4 days in 3 cases, 3 days in 1 case, 2 days in 1 case, indefinite in 1 case.

The duration was ten days or less in about half the cases, while but twelve cases lasted over fifteen days.

We have classed those cases with pulse generally above 80 as "high," those between 60 and 80 as "medium," and those less than 60 as "low." In the first class there are 36, in the medium 9, in the low 3, remainder unrecorded. Irregular pulse is noted in 15 cases, but we believe existed much more frequently, especially early in the disease.

The temperature is classed as high when over 103° for any

great time. Eleven were in this class, one reaching 108° before death and another 107° . Between 100° and 103° there were 17 cases, while generally below 100° there were 24 cases.

The respiration was generally above 30 per minute in 29 cases, between 20 and 30 in 6 cases, less than 20 in one, balance unrecorded. Cheyne-Stokes respiration is noted in 14 cases.

Unconsciousness is noted in 44 of the cases, and in one it is said to have been absent until death approached.

The pupils are noted as unequal and responding to light in nine cases; the right was dilated in ten cases, the left in four cases, both in ten cases. No pupillary response in nine cases. Irregular pupils in four cases. Optic neuritis was noted in the majority of the cases. Divergence of the eyes is noted in eight cases, convergence in two, divergence to the right in three cases, to the left in one case. In one case each blindness, hippus and ptosis are noted.

Rigidity of the neck was noted in 24 cases, while no statement is made in the remainder.

Muscular twitching is noted in the right arm twice, both arms three times, left leg once, all over three times, and general convulsions occurred in three cases.

Rigidity of the right arm was seen once, left arm once, both arms twice, right leg and arm once, both legs twice, all over five times, and the head was turned to the right once.

The reflexes are noted as increased in 14 cases, as decreased in 5, and absent in 14 cases.

In studying the superficial reflexes it is striking that they were absent in 17 cases, slight in one case, and increased in but a single case. The Babinski reflex is noted on the left side only once, on both sides once. Kernig's sign was frequently present, but we have no exact statistics upon it.

Paralysis was absent in six cases. Five cases presented left hemiplegia, four right hemiplegia, one paraplegia, this being the one noted amongst the autopsies as having the notable affection of the cord. In this case severe pain was noted in the lumbar region and the legs.

Aside from a single case of general hyperesthesia no especial sensory phenomena are noted.

The urine contained albumin in eight cases, and casts were

present in four of these. If full records had been available these figures would doubtless have been much larger.

Tubercle bacilli in the sputum are noted in seven cases, their absence in three cases, remainder not examined.

Among the complications noted are the following:—

Erysipelas twice, tuberculosis peritonitis twice, erythema of great extent twice, alcoholism, melancholia, myelitis, acute pneumonia, phlebitis, uremia, acute bed sores, ulcer of edge of cornea with inflamed conjunctiva and enlarged glands in neck, each once.

In but four instances were we able to obtain post-mortem examinations. In all of them the classical basic meningitis with tubercles was found. In the case with myelitis the cord from the fifth dorsal vertebra downward was of the consistency of cream.

A very large proportion of our cases have been shown to have been in adults, evidently because they have been tuberculous upon coming to the State. We doubt if a similarly large proportion of adult cases could be found in any other State in the Union.

Practically all of the cases occurring in natives of Colorado were in those directly predisposed by heredity. It is probable that in the future owing to the enormous relative proportion of tuberculous parents here, the percentage of cases of tuberculous meningitis in children will become greater than it is at the present time.

In one young man seen with Dr. Drechsler the meningitis was typical, although the examination of the abundant sputum by three different examiners on six occasions showed no tubercle bacilli, but abundant streptococci. This is of interest as bearing on the probable diagnosis of those cases we frequently see in which the usual signs of pulmonary tuberculosis are present but the bacilli are never found.

Tuberculous meningitis might be mistaken for many diseases of the nervous system or for many acute general diseases. The error made in confounding the acute general diseases with tuberculous meningitis is due to the fact that the diagnostician does not give sufficient weight to those symptoms in the general diseases occurring outside of the nervous system.

At times it is difficult to make a differential diagnosis between typhoid fever and the disease under discussion. Headache, delirium and pyrexia occur in both, but in the former the headache

ceases when the delirium is well marked, while in tuberculous meningitis it coexists with the delirium. The pulse in typhoid is not irregular, but is more frequent. The temperature in tuberculous meningitis is very irregular, while in enteric fever it has the characteristic morning fall.

The appearance of facial herpes is always in favor of meningitis, as it is almost unknown in typhoid. In some instances it is impossible to make a differential diagnosis until the appearance of the rash, enlarged spleen, diarrhea and a positive Widal reaction, or positive result from lumbar puncture.

If to the headache, delirium and fever we have added optic neuritis, localized spasms, palsies, or involvement of any of the cranial nerves, the diagnosis of tuberculous meningitis from any of the febrile affections is conclusive.

Anemia of the brain occurring in children, and termed by Marshall Hall "Hydrocephaloid," may simulate tuberculous meningitis, but in this condition the fontanelles are depressed and there are no localizing symptoms. The symptoms are those of extreme exhaustion.

A rapidly growing tuberculous tumor of the pons may produce symptoms resembling those of tuberculous meningitis. The loss of motor power in the limbs in tumor comes on more gradually and the paralysis is definite and focal in character, whereas in meningitis it comes on suddenly and its development is irregular in type. Optic neuritis in tumor of the brain is of a higher grade than that occurring in tuberculous meningitis. The headache in brain tumor is more agonizing and is often localized by the patient. The mode of onset of brain tumors is slow with a prolonged prodromal stage, while in tuberculous meningitis it is more acute with marked variation in temperature.

The differential diagnosis between abscess of the brain and tuberculous meningitis depends principally upon the localizing symptoms, as the abscess occurs in special localities in the brain. The involvement of the cranial nerves is also in favor of tuberculous meningitis.

The temperature of uremia is always subnormal, although there are cases of Bright's Disease where the temperature is high, but this is always due to some inflammatory complication. The careful and frequent examinations of the urine and the presence

of edema or dropsy in some portion of the body along with albuminuric retinitis would establish a positive diagnosis.

In making a differential diagnosis between hysteria and tuberculous meningitis a careful watch for any symptoms of organic disease of the nervous system will prevent this error. The presence of fever, optic neuritis, nystagmus, divergent strabismus or irregular pupils would be in favor of tuberculous meningitis. Strabismus does occur in hysteria, but it is always convergent in character and is attended by spasmodic contraction of the pupil. As to the nature of the meningitis the diagnosis between the various forms can be easily determined by finding tubercles on the choroid or by ascertaining a definite tuberculous family history.

Tuberculous meningitis is sometimes very difficult to diagnose from miliary tuberculosis. In the latter the pulmonary symptoms are prominent and a slight rise in respiration and pulse is observed from the beginning, and there is an absence of involvement of the cranial nerves.

The gastro-intestinal diseases of children can easily be excluded from tuberculous meningitis by the absence of cranial nerve symptoms, the intense headache, optic neuritis and paralysis in any portion of the body.

We would speak strongly of the need of thinking of typhoid fever in every case presenting meningeal symptoms. The usual characteristics of the disease ordinarily suffice for its differentiation, if we only realize that the so-called meningeal typhoid is common in children and is frequently mistaken for some variety of meningitis.

Certain digestive disturbances in children offer almost insurmountable obstacles in the matter of differentiation from beginning tuberculous meningitis. Time easily disposes of this difficulty, but for three or four days the greatest anxiety exists in the mind of the attendant because of the possibility of this disease.

Thus, we saw together a boy of four years, of good heredity, who had long been constipated, had habitually a concentrated urine containing much uric acid, and whose parents had much difficulty in satisfying his capricious appetite. He had large cervical glands during one summer, which decreased under out

of door treatment, cod liver oil and iodide of iron. When winter weather kept him indoors in a flat he was feverish and fretful, slept poorly, lost flesh because he ate almost nothing, was obstinately constipated, complained of headache, lost interest in his play, and was so perverse that no thorough examination could be made. Slight fever existed at times, and the pulse was elevated but never irregular. A calomel purge was very slow in action, and no improvement followed. Up to this time no positive evidence existed and we admit no reason for extreme anxiety. But the dreadful possibility of tuberculous meningitis could not be gainsaid, and every day added to chances. After six days the calomel finally acted freely, the urine became abundant under the administration of acetate of potash, the uric acid disappeared and recovery ensued. Dr. Hall has recently seen a parallel case with Dr. Russell of Arvada. Such cases in children must always cause uneasiness, for most cases of the dread disease start in about this way.

LEPROSY SIMULATING SYRINGOMYELIA*

By HERBERT C. MOFFITT, M.D.,

OF SAN FRANCISCO

Some of the members present may remember a woman sent to the City and County Hospital about two years ago with the diagnosis "leprosy." Her hands showed extreme trophic changes and mutilations of the Morvan type; there were marked disturbances of sensation to pain and temperature and advanced atrophy of small hand muscles and muscles of the shoulder girdle. The presence of bulbar symptoms, however, of marked scoliosis, bladder symptoms, extreme spasticity of the lower extremities with clonus and Babinski decided absolutely for syringomyelia and against leprosy.

This boy of eleven, born in the Cape Verde Islands, of Portuguese parents, has been under observation in hospital during the past weeks. His history is difficult to obtain, as his mother refers all symptoms to falls at different times. The father is living in the Cape Verde Islands, and has had some sort of a "sore" on one leg for years. The beginning of the affection is variously dated. The right foot has slowly assumed its present position during the past five or six years. The affection of the left hand was first noticed after a fall on the ice in New York, December, 1903, and the hand was thought to have been frozen. There never has been pain. With this unsatisfactory history we come to the examination:—

The skin in irregular areas over the neck, trunk, arms and thighs is a muddy yellowish brown. Over the forehead it looks thin, and contains less than the normal amount of pigment. Scattered over the trunk, arms and thighs are circular or oval whitish patches, in some places on the back almost exactly symmetrical. These patches are not anesthetic, and sweat equally with other parts of the skin after pilocarpin administration.

There are numerous small hard glands in the posterior triangles of the neck, in the groin and axillæ. The ears are not deformed. Teeth are normal. The nose is thick and some-

* Read before the San Francisco Academy of Medicine August, 1905.

what flattened. There is no evidence of septum ulceration. There are no stigmata of syphilis. The face is irregular, but there is no sympathetic lesion.

Pupils are normal. Nystagmus is absent. Cranial nerves are unaffected.

The left small occipital, the right great auricular and both ulnar nerves above the elbow are decidedly thickened. The right ulnar nerve is tender. There is no scoliosis.



The left hand is a typical claw-hand with clenched fingers and atrophy of the small muscles. Trophic changes are shown by the deep cracks, thickened skin and nails, small ulcers, and deep purplish color. There is reaction of degeneration in the small hand muscles. The fingers can be extended at the first phalanx only; the thumb cannot be fully extended or abducted.

There is no rigidity of arm or forearm, and arm reflexes are normal. There are beginning trophic changes in the right hand, but no muscle atrophy. There is no palsy except of atrophied muscles.



Abdominal muscles and reflexes are normal.

There is no bladder disturbance.

The right foot is in marked equino-varus position. Two perforating ulcers on the outer border mark the points of pressure. On the heel is a deep, fresh wound caused by a nail in his shoe which projects fully half an inch, but it caused no pain and was not noticed.

The nails are curved and thickened.

There is no palsy except in the atrophic group of foot extensors. The tibialis anticus and peronei give complete R. D. There is absolute lack of rigidity. Knee and left Achilles jerks are normal. The right Achilles cannot be obtained. There is no Babinski. The plantar reflex is abolished. Romberg and ataxia are not present.

Sensory findings vary somewhat on different examinations, and there seems now a functional addition to the original changes.

There is loss of sensation to temperature in the whole of the left ear. There is thermanesthesia down a strip about $1\frac{1}{2}$ inches wide on the posterior surface of the left arm. Below the elbow there is complete analgesia and thermanesthesia with definite hypesthesia. The prick of a pin is felt as a touch along the radial border of the arm and on the thumb and first finger, but not along the ulnar side.

In the right forearm analgesia and thermanesthesia are definitely more marked in the distribution of the ulnar nerve.

Deep sensation is approximately normal. There are no sensory changes over the trunk or thighs.

In the right leg the areas of athermia, analgesia and anesthesia cover the entire foot and the lower half of the leg, running up higher on the outer and posterior surfaces.

On the left side there is anesthesia, analgesia, and thermanesthesia over the sole, a small patch on the outer side of the calf, over the fourth and fifth toes, and over the dorsal surface of the leg to the middle of the calf. X-Ray shows the foot bones to be normal.

The appearance of the foot might suggest the neural form of progressive muscle atrophy, but the affection is usually symmetrical, of slower development, and such extensive sensory changes do not occur. The affection described by Dejerine and Thomas under the head of "Névrite interstitielle hypertrophique et progressive de l'enfance" is marked by thickening of peripheral nerves, but pain, ataxia, changes in reflexes are common features.

Differential diagnosis has to consider essentially two affections—syringomyelia and leprosy. Against syringomyelia would speak:—

(1) The absence of sympathetic eye signs in presence of the involvement of the small muscles of the hand supplied by the first dorsal segment; (2) the absence of scoliosis; (3) the absence of rigidity and of increased reflexes: especially the absence of these signs in the lower extremities; (4) the distribution of the palsies—left hand and right foot, and the limitation of palsies and atrophies to the distal parts of the extremities; (5) the absence of ataxia and sphincter involvement; (6) the loss of temperature sense in the left ear, and the limitation of sensory changes in the right arm to the areas supplied by the ulnar nerve; (7) the absence of Babinski and the abolition of the plantar reflex; (8) the widespread involvement of sensation in the lower extremities; (9) the thickening of the peripheral nerves.

The skin changes would weigh more for leprosy. Leprosy, as we know, is common in the Cape Verde Islands. Bacilli have been sought in the blood, in nasal secretion, and in blister fluid without result.

The boy will be given Shaulmoogra oil and, later on, Calmette's serum.

TYPES IN MENTAL DISEASE.

By WILLIAM A. WHITE, M.D.

OF WASHINGTON,

SUPERINTENDENT OF GOVERNMENT HOSPITAL FOR THE INSANE.

In the progress of science synthesis and analysis play equally important and complementary parts. They are rarely used together but generally the methods of first one, then the other, hold sway. Analysis, for example, proceeds until confusion is threatened by the multiplicity of detail when synthesis steps in and brings order out of chaos. On the other hand synthesis oversteps itself and generalizes beyond the warrant of facts to which final appeal must be had by analysis as a correction. Analysis furnishes the means of inductive reasoning. Synthesis by generalizing the results so obtained becomes philosophy. These opposing tendencies are well exemplified in the history of psychiatry. Until very recently all forms of mental disease were included under a very limited number, usually only three or four captions. In the second edition of Griesinger's work printed in 1882 we find all varieties of insanity included under three forms: states of mental depression; states of mental exhaltation; and states of mental weakness. In the past few years, however, psychiatry under gone a great change, particularly under the influence has the German school, and no modern text-book presents the subject of classification in such simple garb. Régis describes upwards of sixty species and at least one author considerably more.

The problem of classification has been occupying the foreground and has been considered from every possible standpoint: the etiological; the symptomatological; the pathological; the psychological; and lately from the point of view of natural history, course, and termination. The result has inevitably been the description of innumerable forms of mental alienation on the one hand while on the other certain symptom groups, the manic-depressive, the dementia præcox, etc., have seemed to stand out more prominently from the mass of detail and there has been a generalized and concerted movement to crowd all sorts of cases under these heads.

At no time has there been a general recognition on the part of alienists of the possibility of a philosophy of mental diseases. We do not find during this period that the general field of mental alienation has been comprehensively and adequately considered as a whole from any point of view but on the contrary the whole tendency of recent years has been toward the creation of disease entities, of clinical types.

While perhaps the facts are not sufficiently numerous and well founded to warrant the expectation that general conclusions of lasting value could be expected yet there are certain considerations which seem to me worth while in connection with this tendency to the multiplication of types.

In the first place it would be strange indeed if the human brain with all its bewildering complexity of structure and function should only be subject to three forms of disease producing insanity as set forth in the classification of Griesinger. We might therefore expect with an increasing knowledge of the mind that a progressively increasing number of disorders would be recognized. This has as a matter of fact taken place but the difficulty in the whole situation has been that no comprehensive idea has seemed to prevail as to what constituted a type and as a result the conception of types has been too fixed, too inelastic.

The same condition of affairs prevailed in the realm of biology with reference to the conception of species. When the concept of species first arose it was thought to represent a very permanent thing, something definite and invariable in nature. This conception, however, had to give way before the evolution hypothesis the very essence of which is the theory that higher forms of life are developed from lower and which therefore of necessity predicates the existence of transition forms which as a matter of fact are found in great profusion in nature.

It is the same with these so-called clinical types. They are not clean cut entities but are only groups of symptoms which either seem to occur more frequently in combination or else have been more definitely and clearly seen because of the nature of that combination. In fact types as such may be said to be in the minority. The great mass of cases seen are in combinations more or less intermediate in character. The conception of mental disease in order to be accurate must be from a broadly biological

view point. Types are like species. They have innumerable transitions and intermediate forms. It is as if overlooking a vast though young forest. Here and there certain trees because of their great size or prominent location would stand out distinct from the others. These would at once be picked out by the observer as types, yet the forest as a whole is not composed of these but of the immense number of smaller trees among which these few stand out definitely, and a more detailed study of the majority of the trees of approximately the same size would reveal minor differences of structure; for example, in the form of leaf, thickness of bark, inclination of branches, color of flowers, etc., many of which might only serve to distinguish the individuals while others would be of sufficient importance to constitute varieties, or even species.

The conception of disease types having hard and fast boundary lines is consonant with the conceptions of the old psychology which looked upon mind as composed of a number of cubby holes in each one of which was pigeon-holed a faculty and each faculty—feeling, intellect, volition—was just as distinct from the others as the conception implied. Now, however, this is all changed. Mental processes, from their incidence in sensations to the release of the motor responses constituting conduct are conceived to have as their physical substrate a continuous neural process. Sensation verges into perception, perception into apperception, perception and apperception into ideation and idea association, ideation and idea association into reasoning and the formation of judgments, the formation of judgments into the formation of motives, and motives become the starting points of the release of the motor responses which produce actions—conduct. The process, although differently named in different parts of its course for convenience of designation is a continuous one and it would be hard indeed to imagine a disease affecting exclusively only a certain part of it. It would be equally hard to imagine how disease could affect this process in many individuals without producing innumerable clinical pictures with all grades of transition forms.

These transition forms are very numerous. We often see cases which resemble equally dementia præcox and manic-depressive insanity, manic-depressive insanity and involution melanchol-

ia, incipient paranoia and dementia præcox, manic-depressive insanity and a toxic exhaustive psychosis, and so on, indefinitely.

In the cases that resemble equally manic-depressive insanity and dementia præcox it is customary to wait and if the case gets well call it the former, if not, the latter. But this is hardly a rational procedure. I can remember well when the diagnosis of diphtheria was not made unless the patient died. We should at least recognize the possibility that these cases may be transition forms—to be perhaps erected into specific types if they occur with sufficient frequency.

Aside from the occurrence of intermediate and transition forms it is equally conceivable that various types—symptom groups—may occur combined, superposed one upon the other. Again what we might conclude *a priori* would be the case we find by an appeal to facts really is the case. Symptom groups ordinarily occurring only under certain circumstances are now and again, I might even say are not infrequently found under quite different conditions.

Krafft-Ebing many years ago called attention to the fact that paranoiacs might develop paresis and while in my own experience covering several thousand cases I have never seen this combination yet I can conceive of no reason why it should not occur. There are combinations, however, which are quite frequent and which have only received inadequate notice and even for the most part go unrecognized.

I refer particularly to the condition of so-called *secondary confusion* to differentiate it from the primary toxic-exhaustive deliria—or *primary confusion*. This is a condition which may, and frequently does, develop in the course of any of the psychoses. The insane are just as susceptible to toxic and infectious agencies as the sane and when such etiological factors operate they develop a toxic delirium in the same manner only here it is designated as secondary because following or occurring in the course of another psychosis.

Secondary confusion occurring in the course of a well developed paranoia would probably be at once recognized as such but it often occurs under conditions which obscure its recogni-

tion and lead the observer to believe it part of the original psychoses. This is preeminently seen in the hyperacute maniacal forms of manic-depressive insanity. Here we find a wildly excited patient, quite completely confused, with only here and there an indication in the midst of almost absolute incoherence, of the flight of ideas which he, perhaps only a short time before, showed typically, greatly emaciated, taking little or no food, tongue and lips dry, perhaps sordes on the gums, sunken eyes, numerous bruises which it is impossible to keep dressed, and an elevation of temperature of two or three degrees. This is a typical picture of the so-called acute delirious mania, but certain indications of the two diseases—manic-depressive insanity and infectious-exhaustive delirium—are present. The incessant activity is largely manic, the complete incoherence delirious, while the history if complete would probably show the true relations, and I believe a certain proportion of the cases which have been described under this caption have in reality been cases of manic-depressive insanity upon which has been engrafted an infectious-exhaustive delirium—a secondary confusion.

Again we are led to believe that one of the distinguishing features of manic-depressive insanity is its failure even after a long time to produce dementia. When we see dementia occurring in its course then we should look for other possible causes. Perhaps most frequently we will find the dementia is a true senile or pre-senile dementia which has come along in the natural course of events and notwithstanding that the patient has already a well developed psychosis. Perhaps in some other cases it may be post-infectious or perhaps arteriosclerotic. The main point being that because a person has manic-depressive insanity is no reason he should be immune from the ordinary diseases that affect the brain and impair the mind.

One of the more common combinations is the occurrence of neurasthenic symptoms in the early stage of paresis, while a symptomatic depression is frequent as a result of the depressing obsessions of psychasthenia, and who has not seen hysteria assoanoia syndrome in manic-depressive insanity, dementia præcox. Alcoholic delirium in manic-depressive insanity and paresis might also be mentioned as not uncommon.

Aside from this admixture and overlapping of types as above

set forth by a few examples we find perhaps more frequently certain associations of groups of symptoms, perhaps typical of well defined types, present in other diseases. Thus we find the paranoia syndrome in manic-depressive insanity, dementia præcox, and paresis; flight of ideas in dementia præcox; the Korsakoff syndrome in senescence and paresis; the presbyophrenic syndrome in paresis; katatonic rigidity and negativism in the toxic-exhaustive psychoses and so on indefinitely.

Whoever can satisfactorily explain these and various other syndromes occurring so frequently in the realm of mental disease will do much towards adding to the clearness of our conceptions of mental alienation in general and to the clearing up of many distinct and separate problems in particular.

Perhaps no one of the general conceptions of psychiatry has been so much abused both in theory and practice as the conception of dementia. Terminal dementia was for generations the convenient and ever handy waste-basket of the psychiatrist into which he calmly dumped all the cases he could not classify. Then to add to the confusion he came to recognize, because of certain superficial resemblances, a form of primary or acute curable dementia with very favorable prognosis.

The symptom dementia, to my mind, should be understood to include only conditions of permanent mental impairment (I am not now referring to the term dementia præcox) and broadly conceived from this point of view it presents certain valuable and important implications.

Dementia is a symptom often found and found under, superficially at least, widely different circumstances. Certain diseases of the mind tend naturally toward dementia, such as paresis and dementia præcox, while others do not, such as manic-depressive insanity. In the latter class of cases, however, as already indicated dementia may supervene as an accidental symptom—an epiphenomenon. Now, if it can be shown that mental diseases are separable into two main divisions one in which dementia is a natural outcome, and the other in which dementia is a purely accidental—not necessary—symptom I think we have a broad basis for classification and a synthesis, with reference to the former group at least, which must be of value.

If we attempt this separation into the dementing and the non-

dementing psychoses we shall have little difficulty until we come to paranoia. This disease is generally held to belong to the latter class but I have held for a long time and firmly believe that that is not its true place.

When the term paranoia first came into use the number of cases included under it by some alienists was tremendous. It seemed as if the description of this new disease had solved all the difficulties of psychiatry and large numbers of obscure and previously unsatisfactorily classified cases were included within its domain. Now, after years of experience with this disease type the pendulum seems to have swung to the other extreme and we are beginning to feel that perhaps there is no such things as paranoia, strictly speaking, after all but only frequent combination of symptoms which are known as paranoid or paranoic which may arise in the course of several mental diseases. The basis upon which true paranoia has been differentiated from other conditions has often been on the absence of impairment, and when paranoid symptoms were associated with marked intellectual impairment, the diagnosis has been dementia præcox. It seems to my mind very questionable whether this diagnosis can be maintained and whether we are not really dealing with two extremes between which every possible transition form may be found.

A woman who expresses the idea that her husband is untrue to her has so far not shown any signs of intellectual impairment or expressed an idea which inherently shows any evidence of intellectual impairment; when, however, she adduces as proof of this statement the fact that when she looked out upon the street the morning following a snow storm she saw numerous footprints among which she distinguished those of a woman who had been to the house during the night to meet her husband, and without any additional facts presents this argument in support of her previous statement it would seem that we are justified in saying that her judgment in this specific instance is poor, and when we find that all of her arguments in support of her ideas are of a similarly flimsy and unwarranted character, that her judgment is impaired, and although this patient talks reasonably about most things, is acute to perceive, and under ordinary circumstances shows no outward signs of mental disturbance or impairment, yet I cannot see how we are to escape the conclusion that impairment

actually exists. She is suffering from that condition so well expressed by the German word *Kritiklosigkeit*.

The delusional system which this patient has built up is founded upon ideas which have no answering facts in actual experience and to be consistently maintained the patient must be afflicted with serious defect of judgment.

Now judgment is a function of the intellect so that a defect of judgment presupposes an impairment of the intellect. Can not this impairment be properly regarded as the earliest symptom of dementia. Is there any essential difference, other than one of degree, between the belief of one patient that his food is poisoned and the belief of another that he has no hands? Is not the fantastic, absurd nature of the delusion simply a measure of the intellectual impairment? The delusion of poisoning is just as far removed from facts and has no more foundation in experience; it is, however, more probable, less absurd, presents fewer unusual features because the judgment is not so seriously impaired.

If this condition can be called dementia in its earliest manifestations then its separation from the better recognized conditions to which the term dementia is usually applied is a separation only of degree. The whole case from an intellectual standpoint would appear to be one of degree and I firmly believe there may be found every grade of transition between the most typical paranoia on the one hand and the profoundly demented case of paranoid dementia on the other.

In a further endeavor to correlate various disease types from the standpoint of the dementia syndrome a resort to a figure of speech for the elucidation of my meaning seems to me desirable.

The launching of a human being upon the world may be compared to the issuing of a bullet from the muzzle of a rifle. At the moment of starting a certain potentiality is developed, which we speak of as initial velocity, that under ordinary circumstances, that is the ordinary effects of gravity and atmospheric resistance, will carry it a certain definite distance—the normal span of life. If, however, the charge of explosive—developmental force—has been deficient or the resistance to the bullet—stress—has been unusually great or both of these factors operate together the bullet will fail to reach the normal limit of its flight.

Thus we see individuals who are thus lacking in their inherited tendencies toward development breaking down and de-

menting under relatively very light stresses or even under conditions where stress in the ordinary sense of the term can hardly be said to be present at all. A certain proportion in whom the developmental force is very inadequate break down at the period of puberty and adolescence—others weather this condition only to go to pieces under the stress incident to pregnancy, parturition or lactation, while still others reach the climacteric which if passed in safety is shortly followed by senescence which claims so many victims.

Aside from the physiological crises many of these cases under favorable conditions get on fairly well but go to pieces under accidental stress such as intoxicants, infections, trauma, prolonged worry or anxiety, strong mental shock or other physical or mental stress making in general for toxemia and exhaustion. An attack of one of the specific fevers such as typhoid, produces an unusually marked delirium which is prolonged into convalescence and only subsides to leave the patient with a permanently shattered mind.

Classifying insanity upon the basis of the dementia syndrome we would have the following results.

NON-DEMENTING PSYCHOSES.

1. INFECTION-EXHAUSTION PSYCHOSES. (febrile delirium, post-febrile psychoses, collapse delirium)
2. TOXIC PSYCHOSES.
 - a) Endogenous (uremia, diabetes, myxedema.
 - b) Exogenous.
 1. Alcohol.
 2. Opium.
 3. Cocaine.
 4. Mixed Cases.
 5. Miscellaneous Intoxicants.
3. MANIC-DEPRESSIVE PSYCHOSES.
4. PSYCHOSES ASSOCIATED WITH OTHER DISEASES.
 - a) Nervous diseases (functional, not destructive in character, such as chorea.)
 - b) Diseases other than nervous (cardiopathies and visceral disease not producing infection or exhaustion.)
5. THE PSYCHONEUROSES.
 1. Epilepsy.
 2. Hysteria.

3. Neurasthenia.
4. Psychasthenia.
5. Hypochondriasis.
6. CONSTITUTIONAL PSYCHOPATHIES (constitutional depression, sexual inversions, pathological character.)
- DEMENTING PSYCHOSES.

1. DEMENTIA PRAECOX.
2. INVOLUTION MELANCHOLIA.
3. SENILE AND PRE-SENILE PSYCHOSES.
4. PARANOIA AND PARANOID STATES (not otherwise classified.)
5. PARESIS.
6. PSYCHOSES ASSOCIATED WITH OTHER DISEASES.
 - a) Nervous Diseases. (organic and destructive such as multiple sclerosis, polyneuritis.)
 - b) Organic Diseases and Injury of the Brain. (tumor, hemorrhage, softening, meningitis, arterio-sclerosis.)

Of course it must be understood that the non-dementing psychoses may produce dementia in an unstable or greatly predisposed individual. Alcohol, however, if persisted in will produce degeneration in the strongest character while delirium may be associated with a febrile movement, if only it is sufficiently severe, in the most stably organized individual. The dementing psychoses on the other hand tend naturally because of their very nature to lead to permanent mental impairment.

It is aside from the purposes of this paper to discuss the pathology of these several conditions. On general principles, however it would seem fair to assume, and Bolton* in a recent excellent study has in fact attempted to prove, that *dementia* is the expression of "*neuronic degeneration*" he believes in every instance "*following insufficient durability.*" As a further result of his studies he describes the condition of *amentia* as occupying a mid-position between these dementias on the one hand and normal individuals on the other hand and states the underlying condition to be "*deficient neuronic development.*"

A consideration of the dementing psychoses, especially those that occur at the critical periods of life, adolescence, the climacteric, and the senium—from these general view points; namely, as being due to a failure in the developmental forces and "deficient neuronic development" and resulting in "neuronic degeneration" will make their relations to one another much more clear. We can correlate the confusion, the emotional deterioration, and mem-

*Amentia and Dementia. *Journal of Mental Science*, April 1905.

ory defects of dementia præcox and senile dementia and can understand that the peculiar disturbances of motility in katonias may be found in certain cases of senile dementia or on the other hand be represented in the resistance of involution melancholia. We can understand why our cases of involution melancholia do not get well and how it is that we frequently find signs of arterial degeneration and pre-senility in cases of adolescent insanity. We can also understand why in certain toxic-exhaustive cases developing in predisposed individuals we might get symptoms of this adolescent-climacteric-senile group, for example negativism, catalepsy, stupor, etc.

Again is it easy to conceive why in paresis with its widely destructive lesions, arterio-sclerotic brain disease with extensive cortical devastations, and polyneuritis with its associated central degenerations we should often get the same combinations of symptoms—the Korsakoff syndrome. We see also why arterio-sclerosis and multiple sclerosis often closely resemble paresis and finally how it is that symptoms of amentia, “deficient neuron development,” such as obsessions, impulsions, hysterical and neurasthenic syndromes may crop up and complicate the picture in any of these conditions.

SUMMARY.

In summing up, the conclusions and arguments of this paper naturally arrange themselves under five heads.

1. The necessity for a broad biological view point in considering the problems of mental alienation.
2. The inconstancy and variability of types in mental disease as shown by:
 - a. The occurrence of transition and intermediate forms.
 - b. The overlapping or superposition of clinical types..
 - c. The occurrence of special groups of symptoms—syndromes—in widely different clinical pictures.
3. The desirability of a pause in the universal tendency to the analysis of mental symptoms for the purpose of developing general principles under which to group results.
4. The suggestion that a great deal could be accomplished in this direction by the study of certain symptom groups apart from the special diseases which they more or less typify.
5. The illustration of what can be accomplished by this method by its application to the dementia syndrome.

THE IMPORTANCE OF THE EARLY DIAGNOSIS OF MENTAL DISEASES.

BY GEORGE STOCKTON, M.D.,
OF COLUMBUS, O.

SUPERINTENDENT COLUMBUS STATE HOSPITAL.

It has long been known that the insane hospitals are largely filled with individuals who have carried with them for perhaps a considerable period the predisposing causes of insanity. Of these the most important of all is heredity.

It is very difficult to get a complete history in cases of insanity, the friends seem to think it is a disgrace or a stigma, fear that the history may become public property and so affect the welfare of other members of the family. In many instances in our examination of cases, while interrogating the friends we are so impressed with their unreliableness as to place but little confidence in their statements. Where the patients are intelligent enough, or where the form of disease is of such a nature that we can depend on what they say, self interest controls them so as to render their statements more reliable.

The percentage in which heredity forms an active predisposing factor varies with different authors. I believe it occurs in 40 to 50 per cent. of all cases. In the report of the Columbus State Hospital for this year, we will have a table covering the hereditary tendency in the admissions for that time. Taking the whole number of admissions, and excluding those in which it was impossible to obtain the data desired, we found that the hereditary tendency existed in 35 per cent. The disposition to the disease is of course the quality transmitted; given a neurotic ancestry it is not infrequent for some of the other neuroses to appear instead, for instance hysteria, epilepsy, chorea, etc., perhaps in a following generation some form of insanity will be in evidence. Krafft-Ebing says the transmutations are innumerable. The most various neuroses and psychoses appear in families affected with heredity, side by side, and one after another through generations they teach us that from a biologico-etilogic standpoint they are branches of but one and the same pathologic tree.

In a northern city they have appointed a commission to examine into suicidal cases. The object is, I believe, to have these individuals report to the commission, and it is then their duty to confer with the persons applying for conference, and if possible prevent them from consummating the act. The work of this commission will no doubt be observed with great interest by the profession at large; it is certainly a praiseworthy effort to endeavor to mitigate events which startle and shock the community in which they occur. I doubt very much, however, if a person dominated by an impulse to suicide is likely to confide in anyone. Suicide is almost always a symptom of mental depression, there is a neuropathic predisposition, in fact instances are frequent where persons inheriting this tendency have suicided at the same age as their ancestors.

In writing upon the hereditary predisposition to insanity and suicide, Weir Mitchell says: "There are people with depressed tendencies who live below the normal level of natural cheerfulness, who are predoomed to have, at irregular intervals, attacks of melancholia, and are prone to suicidal temptations." He says further: "I know of but one instance of a family who resolved by avoiding marriage to end what had been ancestral generations of disaster of successive suicides." He gives a history of this remarkable family which I will take the liberty of quoting, cutting out some unnecessary sentences for the sake of brevity. Dr. Mitchell says the family were average in type intellectually; he knew four of them, three were sallow, dark, and had black hair. They described their parents, who were cousins, as having a like appearance physically, they were sluggish physically, and lacking in gayety. In about one hundred and fifty years of the history of this family in various lines of descent known to the descendants, they had eleven suicides, nine males and two females. There were several epileptics, much alcoholism, and in many instances insanity, acute mania sometimes, but generally melancholia. Thirty years ago, the family became reduced to three single women and one man. An agreement was entered into not to marry, and was scrupulously kept.

Physicians are often called upon to advise concerning young boys and girls; the parents will tell you their sons and daughters are not like their normal self; from being studious and industrious they become careless and indifferent, go so far in their studies,

and apparently are not able to advance any further. Sometimes teachers advise the parents to remove their children from school, that it is wasting time to send them any longer; children who have heretofore been truthful and trustworthy, become unreliable, sometimes run away from home and cause their parents untold anxiety, their moral sense blunted, they form debasing habits, and associate with evil companions. From being frank and open in their conduct they are reticent and avoid companionship. Associated with other symptoms and the fact that these changes occur at the age of puberty, at one of the involution periods of life, a diagnosis of dementia præcox is justified, and if recognized in time great good can often be done in arresting the disease or preventing great sorrow to the parents by having the patients put under restraint before they commit some act that brands them with disgrace. Young girls in the early stages of this disease develop diseased mental processes, weak will and inability to withstand temptation.

In my opinion the Kraepelin classification gives a clinical picture of this disease so clear that it is not difficult to recognize the different varieties. The old classification of moral insanity is so indefinite as to easily lead to confusion, and yet the clinical picture drawn by some authors differs but little in the general outline. Take for instance Livi, he calls this class of patients moral fools; he regards them as being born for evil doing; he speaks of the unfitness of the mind for study, inability to manage their own affairs, or to do anything wise or reasonable, strangeness of ideas, absurdity of judgment, etc.

We have a man in the Columbus State Hospital at the present time who shot and killed a friend and neighbor with whom he was walking in a social way; they had had no quarrel, the crime appeared without motive. On examination he was found to be insane, it was so evident as to admit of no doubt. He attempted suicide the first night he was in jail, and repeated his attempts after reaching the hospital. This man was obsessed by fear after the homicide, not fear of electrocution, but fear that his life might be taken in some mysterious way. He wished for some one to kill him, or to be allowed to do it himself; he had suffered so much that he was a physical wreck, had not had any sleep to amount to anything for weeks, at the present time talks of nothing but suicide, is obliged to be watched constantly, and

sings over in a monotonous way his desire to "hang again to stay." If this condition had been recognized and the family obliged to have him put in confinement a tragedy might have been averted.

This man for some time previous to the homicide had delusions of persecution, suffered from insomnia, his general health was poor, he talked a great deal about certain persons having it "in for him," etc.

Recently a man in the southern part of the state shot a prominent citizen on the street in broad daylight, and so far as can be learned without any particular motive. He was tried by a jury and pronounced insane. Evidence was brought before them to show that for years he had been manifesting delusions of persecution, was apprehensive, thought that everyone was conspiring to take his life, or to do him bodily harm, that the food brought to the house was poisoned. He associated with no one, secluded himself, slept some of the time under the bed for fear of bodily harm, had depressed delusions, imagined that part of the glans penis had been removed by some doctors who had circumcised him, tried to employ lawyers to bring a suit for mal-practice against the doctors. He claimed by this operation his life was ruined, and that there was no use in trying to engage in business or make any attempt to be a man of affairs, as his enemies would never let up on him. He had had the typical symptoms of dementia præcox for years, probably twelve, at the time of committing the crime it had assumed the paranoidal type. It had been suggested by friends that he ought to be sent to a hospital, but he had an aged mother, and relatives, who thought him harmless.

In my opinion the tendency to seclusion in these cases is a dangerous symptom; the persons do not come under the public eye as an acutely disturbed case would. A physician who was the family doctor says that in his visits to other members of the family he scarcely ever saw this young man.

In a recent article in the *Journal of the American Medical Association*, Dr. John Punton of Kansas City, Mo., writes very entertainingly on the importance of these early diseased conditions being recognized by the general practitioner. Among other things he alludes to the practical trend of the papers read before the last meeting of the American Psychological Association. The bur-

den of the themes presented, was intended to enforce at least three practical truths: first the great necessity for a more thorough knowledge of insanity by the general practitioner, second the marked and prompt curability of insanity in its incipiency, third the extreme susceptibility of insanity to prevention.

There is no person who gets so close to the heart and mind of an afflicted person as the family physician; this is especially true I think in nervous and mental diseases. The family doctor can often get the confidence of his patient, and the latter will pour out his troubles, his fears and delusions more readily to the former than he would, usually, to a stranger. The medical adviser is often, and generally, the first one to whom an anxious mother will go to describe changes and peculiarities they observe developing in members of their family. These confidences are expected by the parties concerned to be confidential, but if a physician believes that he has evidence that a dangerous psychosis is developing under his observation, he should advise the friends as to the proper course to pursue, and if they will not be guided by his counsel he should take the matter in his own hands. If the friends take exception to his course, he can rest assured that the public at large will admire and support him.

There is another mental disease to which I wish briefly to allude and that is paresis, or general paralysis of the insane. I believe that in some instances at least, if a diagnosis were made in the incipiency of the disease, some good might be done; except where the disease is ushered in by a convulsion or a series of them, they are rarely brought to a State Hospital before the trouble is considerably advanced. The early symptoms, such as the change in disposition, the tendency to talk about themselves and their business, the exaggerated feeling of well-being, taking on of intemperate habits by men who had formerly been exceptionally temperate, buying articles for which they have no possible use, etc. It is rare for friends to regard a paretic as insane in the early period of the disease, it is not rare for a man to ruin himself financially by extravagant habits before a positive diagnosis is made. I do not regard this as a generally curable disease, but believe that placing a person under restraint, or sending him to some quiet retreat, where he could have baths and eliminative treatment very early in the disease, would give him a remote chance, and this chance would be more promising

the earlier the diagnosis is made. An individual having this disease, in case it is diagnosed in the incipient stages, should be relieved of all financial responsibility. If his means permitted the proper attendance, he should be sent for a sea voyage, or at least to a retreat on the sea shore, or some place where all the modern appliances would be available for scientific treatment. It is not uncommon for cases of this kind to develop dangerous homicidal tendencies, for that reason, if treated in privacy, proper and qualified nurses should be in attendance night and day.

It is difficult sometimes to draw the dividing line between cases of neurasthenia and certain forms of melancholia. In fact by some authors neurasthenia is regarded as a mental disease.

The sexual neurasthenic is one of the most annoying patients that a physician can have around his office; he is always complaining of indefinite pains, and refers everything to the sexual organs. He complains of pains in the spine, extending to the base of the brain, of various infirmities, has no confidence whatever in himself, is almost entirely incapacitated from engaging in his usual work, imagines that everybody knows of his affliction, that all are aware that he practices debasing habits. If he goes out on the street he imagines he is an object of attention on account of his infirmity, at times he is under the impression that there is a peculiar smell exuding from his person, which can be recognized by his friends, has an expression of pain and suffering about the countenance, is apt to develop strong religious convictions, etc.

The sexual neurasthenics are regarded by Krafft-Ebing as often developing paranoidal symptoms, they have usually depressed ideas as mentioned above, think they are developing locomotor ataxia, insanity, etc. Their delusions of persecution take on the form of apprehension. This diseased condition is associated, as I have stated before, with the sexual organs. They think that everyone knows that they are onanists, imagine that they are being watched and persecuted, everything around them has some relation to themselves. They hear people talking about them, in their reading, they imagine that certain articles are written with the intention of insulting them, often that they have some terrible form of syphilis, people shun them and are disgusted with them, say of them that they are no good, and that they should be removed from the world, and that certain secret societies have set-

tled upon some way by which they are to be tortured or killed. They hear and see everything in a wrong light. These delusions are fed by the neurasthenic sensations the individual has. If they have stomach trouble, which is often the case, they imagine that someone is putting poison in their food, certain enemies are trying to rob them of their reasoning power, and wish to send them to an asylum, circulatory disturbances causing headache, are interpreted as being the result of persecution, they smell some form of anesthetic around the room, think that parties are trying to put them under its influence in order to examine into their private affairs and correspondence and so compromise them. It is not uncommon for these patients to imagine that they are being punished by secret electrical currents, which are sent through their bodies by interested people, that persons come to their room at night and practice certain debasing habits upon them.

In neurasthenia it is not uncommon for a patient to manifest these symptoms for quite a period of time before being regarded as mentally affected.

We have in our institution at the present time a man who was a student in one of the colleges of the State of Ohio. He was a man of marked ability along certain lines, had written some essays, and showed by his work brilliant promise for the future in a literary way. He was poor and obliged to work his way through college. Some of his professors, and also the president of the college, became interested in him and they assisted in every way they could to advance him. When he developed the symptoms of neurasthenia, and it was quite a while before the condition was recognized, he would talk on ordinary topics in an intelligent way, kept track of current events as well as any ordinary person, and was a religious man of thoroughly good habits, and of rather prepossessing appearance. After the symptoms became so marked as to attract the attention of the faculty, he was sent to the hospital for treatment. Naturally he has failed to some extent mentally, as all cases of this kind do eventually, but he still has the sexual delusions, and the chances are he will have to spend the balance of his life in a state institution.

A similar form of neurasthenia which is not uncommon is where the individual refers all his troubles to the heart. On examination, in nearly every instance, no lesion of importance will

be found. There is a complaint of pain in the head, and around the heart, a feeling of impending danger amounting to a distinct fear. These patients not uncommonly commit suicide, they should be regarded by physicians with suspicion, as the border line between sanity and insanity is exceedingly close. As long as you are able to argue these persons out of their delusions, and by logical reasoning convince them that they are wrong, it is not considered an insane condition. When the time comes, however, as it almost always does, when they are so dominated by their delusions as not to be argued with, and will not follow your directions and treatment, they should be placed under restraint, in fact in the early depressed conditions should be kept under observation by members of the family.

It is not uncommon in neurasthenia for a patient to improve for the time being under treatment. They are generally a class of patients who place great confidence in their medical advisers, so much so that they will take up a large part of their time without any value to either, if allowed to do so.

It is difficult in some instances to diagnose between neurasthenia and melancholia, the latter occurs usually at the involution periods of life, at the beginning of old age, and in women at the climacteric. The failure of the general health occurs earlier in melancholia, and is more rapid in the hypochondriacal form which resembles neurasthenia most especially; in the latter there is seldom much failure in the general health, and never until the disease has lasted for a considerable period.

Mental diseases are as a rule slow and insidious in their onset. The so-called exciting causes of insanity are not of much value; while it is true that a shock of some kind may precipitate an attack of insanity, more often it is the fault of the makeup of the individuals themselves.

In almost all the reports of our state institutions, you will see a table headed alleged causes of insanity, that of course means causes assigned by the friends of patients to the examining physician. It is not likely that an attack of insanity is going to be precipitated by a love affair, burning of a barn, or something equally as improbable. Loss of a relative or business reverses sometimes acts as a depressing factor in developing melancholia. Alcohol is a prominent cause in the development of some forms of mental derangement. Given a disposition to mental disease,

alcohol, especially used to excess, fans the flame and assists in producing a diseased condition.

It is not infrequent for the children of alcoholics to develop insanity, and the grand-children some allied neurosis. Syphilis produces disease of the brain, and consequently, not infrequently insanity. It is supposed to affect the structure of the brain, by means of inflammatory processes and conditions brought about by the specific poison.

Paresis, or general paralysis of the insane, is largely produced by the syphilitic poison, in fact some authors maintain that there never was a case of paresis without syphilitic infection.

Society Proceedings

PHILADELPHIA NEUROLOGICAL SOCIETY.

November 28, 1905.

The President, DR. JOSEPH SAILER, in the Chair.

A Patient With Locomotor Ataxia, Presenting Unusual Arthropathies of the Feet.—This case was exhibited by Dr. Philip A. Sheaff. Dr. Dercum thought the case interesting because of the absence of all signs of tabes referable to the eyes and other parts of the body, save the absolute loss of the tendo-Achillis reflex and the extraordinary arthropathies of both feet. The patient had no ataxia and no Argyll-Robertson pupil. There was also some difficulty in micturition. The fact that the knee jerk was absent to ordinary test, but present upon reinforcement was also most interesting.

Dr. Hawke believed that arthropathies in locomotor ataxia and in general paralysis of the insane are more common than are recorded. This fact was borne out in cases he had under his observation in which the X-ray was brought into use and revealed distinct arthropathy where a simple inspection was negative. He believed that in all cases where one joint was involved, the other joints should be X-rayed to see whether they showed involvement also. He mentioned one case in which both knees were involved, and inspection showed no deformity, yet the patient was unable to walk without crutches. In this case the X-ray showed the deformity very distinctly.

Dr. Lloyd believed that a reinforcement in tabes, as present in this case, was really not reinforcement. He stated that a reinforcement is an overflow of a volitional movement. A true reflex travels up through an arc of the cord and back to the muscle, and he did not see how this could be so in tabes.

Dr. Risley stated that he had been struck with the absence of ocular symptoms in this case, although he had rarely seen serious impairment of vision. Some years ago he had seen a case with Dr. Mills in which there was disturbance of vision due to a central scotoma which ended with complete atrophy of the optic nerve in one eye, and later in the other as well. Within a few weeks he had seen a similar case, with total blindness in the left eye, and in the right eye the field of vision reduced to central vision. He stated that in his experience these cases had been comparatively rare, although extra-ocular paralyses and Argyll-Robertson pupil were common.

Dr. Spiller stated that he had examined a case of tabes recently in which the only ocular sign was beginning optic atrophy. In Dr. Sheaff's case pallor of the optic disc was found, and therefore it could not be said that eye symptoms were entirely absent.

A Case of Injury to the Face, Followed by Paralysis of Several Cranial Nerves.—This case was exhibited by Dr. J. H. W. Rhein and Dr. Risley. Dr. Spiller thought the most interesting feature of the case was the presence of the pupillary reflex, with the great disturbance of vision. The lesion was probably in the orbit, and the "pupillary fibres" within the optic nerve being more resistant than the visual fibers had escaped. There is considerable evidence that certain fibers within the optic nerve serve the pupillary reflex and are not concerned with vision.

Dr. Weisenburg remarked that another interesting symptom in the case

of Drs. Risley and Rhein was the hemianopsia. He had exhibited a year ago before this society a similar case, in which an injury to the head had caused hemianopsia. This symptom is usually explained either by a cortical lesion or an involvement of an optic tract. Dr. Risley's explanation, therefore, that hemianopsia can be caused by an injury to the optic nerve is a very important one.

Dr. Rhein was glad to hear what Dr. Spiller had said, as it supported a view which had occurred to him; *i. e.*, that possibly a sufficient amount of pressure had been caused by the results of the accident to prevent certain fibers from transmitting sensations for vision, but had not been sufficient to prevent certain other fibres presiding over pupillary reflexes, from transmitting sensory impulses.

Dr. Risley stated that some years ago he reported seven instances of atrophy following blows upon the orbital rim, and recently in looking over some medical journals he saw that five other cases had been reported in which blows on the rim of the orbit had been followed by optic atrophy. In all of his seven cases the impairment of vision came on in from four to eight weeks after the injury, and all but two resulted in optic nerve atrophy and blindness. In the two remaining cases partial vision was retained.

A Case of General Myokymia was exhibited by Dr. Charles K. Mills. Dr. Hawke asked whether the movements increased when the patient was under mental excitement. He stated that many cases came under his care, alcoholics and excessive users of tobacco, in which the attacks involved the facial muscles, and he had noticed that the movements became worse when the patient was under mental excitement.

Dr. Mills stated (in answer to the question asked by Dr. Hawke) that there was no particular increase of movement as far as he had observed when the patient was under mental excitement. Some distinction must be made between cases like this and cases of tic. He did not believe, as had been suggested, that the case was hysterical. The disease was probably a muscular one, associated with a general neurasthenic state. The explanation of these cases may be found in some form of muscle poisoning or toxemia.

A Rapidly Fatal Case with Symptoms Suggesting Myasthenia Gravis.—This was reported by Dr. T. L. Coley. The discussion was opened by Dr. J. H. Lloyd.

Dr. Burr did not think that Dr. Lloyd's remarks concerning Oppenheim's opinions were quite accurate. Dr. Burr's recollection was that Oppenheim simply stated the existence of a deformity in the aqueduct of Sylvius, and spoke of the possible relation of congenital abnormalities with occurrence of disease. It was quite possible that abnormalities of the spinal cord indicated that the cord was less resistant to disease than normally. In Dr. Burr's first case of myasthenia the thymus gland was present and diseased. At the time he reported the case he did not think it was a matter of any importance. Weigert was the first to show that there could be any relation between disease of the thymus gland and myasthenia gravis. In Hun's paper the persistence of the thymus gland in Dr. Burr's first case was not mentioned. In Dr. Burr's second case, which he and Dr. McCarthy had examined together, the thymus gland was present and the muscles were the seat of lymphoid infiltration. He was of the opinion that there is some causal relation between persistency and disease of the thymus gland and myasthenia gravis.

Dr. Mills said that he had seen this case a few hours before death, and it seemed to him not to be a case of myasthenia gravis. He had recorded several cases of myasthenia gravis, and had seen perhaps a half dozen cases. Fever was present in this case, and fever is not an accompaniment of myasthenia gravis. Sensory symptoms were also present, including acute pain. The case in its symptomatology resembled closely Landry's paralysis or some form of myelitis.

Dr. Dercum thought that there was an acute infection in this case, and that the temperature put myasthenia gravis out of the question. He called attention to the fact that the thymus gland had been found persistent in other conditions besides myasthenia gravis. It had been reported present many times in epilepsy. He also thought it possible that a sarcomatous thymus might generate a poison which is peculiarly toxic to muscles.

Dr. McCarthy thought from the examination of the spinal cord as recorded by Dr. Coley, that this was not a case of myasthenia gravis. The cell changes have been very slight in the cases of myasthenia gravis he had examined, but the toxic changes in Landry's paralysis were well marked. In a recent case where a typical Landry's syndrome existed there was not a normal cell in the entire cord. To classify cell changes of that type with those that have been found in myasthenia gravis he thought was not justified from a neuropathologic standpoint. He thought the microscopic examination as given by Dr. Coley settled the matter distinctly that it could not be a case of myasthenia gravis.

In conclusion, Dr. Coley stated that the clinical picture which the case presented, fitted, in part, into that of Landry's paralysis of reverse type, and yet, there were certain symptoms which are distinctive of those cases reported as myasthenia gravis. Notwithstanding some of the expressions to the contrary in this discussion he felt that his expressed opinion that the pathology of these two diseases has not been satisfactorily worked out, would be fully attested by a study of the literature. The autopsy findings in his own case lent no added light to this differentiation. Clinically, the case seemed to be a doubtful one as to classification, and was so reported.

Dr. A. J. McCarthy reported a case of unilateral tuberculous meningitis.

Dr. William G. Spiller and Dr. G. A. Moleen read a paper entitled "Chronic Anterior Poliomyelitis in the Adult, With the Report of a Case, With Necropsy."

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.

December 21, 1905.

The President, DR. MORTON PRINCE, in the Chair.

A Case of Meralgia Paraesthetica Accompanying Pregnancy.—This case was presented by Dr. Walton. The patient was a primipara in the fifth month. Pain and numbness in the outside of the thigh had been present for two weeks, practically disappearing when in the recumbent posture, but becoming very troublesome on walking. Moderate touch was not felt in the area supplied by the external cutaneous nerve. Pressure of the fetal head has been noted among the possible causes of this affection, but no attention seems to have been paid it in obstetrical literature. While it is possible that altered condition of the blood has something to do with the symptom, in this case it was evident that the mechanical pressure was the essential element; first, from its having appeared at the time when the uterus rises above the brim of the pelvis, and second, from its marked variation according to the posture of the patient.

Syringomyelia.—This second case was presented by Dr. Walton. A woman of forty-three who gave a history of sudden onset seven months ago of paralysis of all four extremities. Gradual recovery in the lower extremities had followed, but there persisted numbness of the ulnar side of both hands (but not limited to distribution of ulnar nerve) with slight diminution of tactile and marked loss of pain and temperature senses, together with atrophy and loss of power of the small muscles of the hands. This probably is one of the comparatively rare cases of syringomyelia with hemorrhage into the cavity, without prior symptoms of syringomyelia.

Syringomyelia, or Occupation Atrophy.—This case was presented by Dr. Walton. A young woman of nineteen, who had worked for several years constantly, and with very long hours, at an employment which required a constant repetition of a sliding movement with the fingers of the right hand over a bench with considerable force. Within the past year has appeared and increased, up to two months ago, a wasting of the small muscles of the hand (interossei, thenar and hypothenar), together with a very moderate numbness confined to a strip on the ulnar side of the forearm in which all forms of sensation are somewhat diminished. This region frequently came in contact with the bench at her work. Of late there has been some pain on the ulnar side of arm. There is no increase in the reflexes or other sign of disorder in the lower extremities. There is diminution of all forms of electrical irritability in the muscles of the hand, but no qualitative change. There is slight weakness of the extensors of the wrist and fingers. The diagnosis lay between syringomyelia and a form of muscular atrophy resulting from over use; *i. e.*, occupation atrophy.

Against syringomyelia was the presence of pain, the distribution of numbness, its lack of dissociation and its moderate degree. Marked muscular atrophy is apt to be postponed in syringomyelia till the sensory symptoms have become marked and extensive. In favor of occupation atrophy is the limitation of wasting to the over-used hand.

The case reminds us of Edinger's valuable contribution on the diseases of over-use in which there is "insufficient nutritive compensation of the katabolic loss which results from function." These diseases he divides into those in which, through poison or embryological defect, the resistance of the nervous elements is so far lessened that the repair is insufficient to keep pace with the effects of ordinary usage, and into those into which the reparative tendency of normal nerve tissues is unable to keep pace with extraordinary usage. In the latter class he cites occupation atrophy.

A Case of Myokymia.—Reported by Dr. J. J. Putnam. The patient was

a young man of about eighteen, now under treatment at the Massachusetts General Hospital.

The signs of his disease consist in the fact that the muscles of both thighs and the left calf, and to a certain extent, also those of the shoulders and of the abdomen, are in perpetual motion of such a sort that when the hand is placed over them the impression received is truly that of waves moving rapidly and irregularly underneath the skin.

This affection had been present for about two months, having developed during convalescence after an operation for appendicitis.

When a child this young man, who is of French-Canadian extraction, and is now a worker in the mills at Lawrence, was attacked with poliomyelitis, which left him with his left leg imperfectly developed. This fact is noteworthy, because the history exactly duplicates that of the case described by Williamson and published in the *Lancet* several years ago.

His muscular contractions are not painful, nor is there any disturbance of electrical reactions of the affected muscles or of the sensibility of the skin.

In some of the reported cases the disorder has passed away after a longer or shorter time, usually a number of months, but an adequate mode of treatment has not yet been discovered, although the efforts hitherto made in that direction have been addressed to the overcoming of some supposed toxemia.

Hypnotic suggestion has been resorted to in this case, and perhaps with some benefit, though this cannot yet be positively affirmed.

The Coming of Psychasthenia.—This paper was read by Dr. Blumer, and will be published in the JOURNAL.

Dr. McDonald thought that it might be well to emphasize the warning already given in Dr. Blumer's paper; namely, of the danger lying in the too general use of the term "psychasthenia." Whenever in psychiatry a new name has been assigned to a group of clinical phenomena, a little more sharply defined than heretofore, there has been always a tendency toward an over use of the new term. As an example of this we have seen in America the excessive and illegitimate use of the term "dementia præcox." We are subject to the same temptation in the use of the word "Psychasthenia," especially since the group of symptoms which has been described under that name is a common feature of many, if not all, of the ordinary psychoses, especially in their beginning stages. Dementia præcox, manic-depressive insanity and general paralysis have frequently in their earlier stages symptoms which can be hardly differentiated from psychasthenia. The speaker mentioned a case in which the earliest symptoms were those of the psychasthenic group alone; *i. e.*, obsessions, phobias, tics, etc. A slight sluggishness of the pupils was all to indicate possible existence of a serious organic disease; nevertheless, now, after three months, the patient presents an unmistakable picture of general paresis.

On the other hand, looking at various mental and nervous disturbances in the light of the description given of psychasthenia is often of surprising value. The professional palsies, writer's cramp, etc., are in a large majority of cases when looked at from this side, merely cases of psychasthenia, accompanied with phobias, obsessions, *sentiments d'incompletude* and shame and dissatisfaction in an habitual occupation. Thus, the case described by Janet of the man who was unable to sit in a chair for more than a very brief space of time, was really a professional neurosis; and in the same way in the case presented by Dr. Prince, of the man who was seized with a spasm as soon as he took his razor in his hand was very probably nothing more than the result of combination of phobias and obsessions.

Dr. J. J. Putnam said that the only serious contribution that he could make to the subject of Dr. Blumer's interesting paper was to call attention to the need of recognizing the fact that the group of patients whom we have hitherto classed as neurasthenics are apt to present peculiarities of bodily structure out of proportion to the gravity of the mental symptoms, and that this, coupled with the fact that neurasthenia cannot justly be con-

sidered as the parent of the graver psychoses in spite of many statements to the contrary, justifies the recognition of that designation as indicating a special class of cases. He agreed with Dr. Knapp that it is not proper to lay too much stress upon the mental symptoms of neurasthenics, at least without recognizing that these symptoms often arise in a strictly logical manner.

Dr. Walton coincided with the reader regarding the constitutional mental element in so-called neurasthenia. Even before Dana's excellent contribution on this subject they had become accustomed in the Neurological Department of the Massachusetts General Hospital, under the influence of Dr. Putnam, to group these cases under the term psychoneurosis. As a result, neurasthenia has almost disappeared from the records. If a term is needed to replace it the one whose claims have been so ably presented by Dr. Blumer deserves consideration, but Dr. Walton was not convinced that it should be at once accepted. If, for example, psychasthenia is intended to apply particularly to the ideo-obsessive class, in which mental spasm is quite as prominent a feature as mental asthenia, the choice did not seem a happy one. If, again, the word is not to be limited to a definite group, but is to include simple physical and mental exhaustion as well as the obsessions, scruples and tics of the deviate, which do not necessarily imply exhaustion or lack of vitality, psychasthenia offers no advantage over psychoneurosis, but rather the disadvantage that it conveys a possibly misleading suggestion.

It has been intimated that the word is intended to represent the first step in the lowering of mental energy, which precedes more profound and varied disturbance, but under it are included cases presenting in themselves a profound and complete type of disorder; namely, the confirmed hypochondriacs. It seems going far afield to regard such conditions as preliminary to general paralysis.

It is doubtless true that psycho-neurosis is a very inclusive term, but it is at least open to no misconstruction, and Dr. Walton hesitated to displace it on his records until its subdivisions are better defined and more appropriately named than at present.

Dr. Courtney considered that this Society was very much indebted to Dr. Blumer for a characteristically charming piece of English, and for a clear-cut presentation of the semiologic aspect of what Janet has so well termed an "*abaissement du niveau mental*"; in other words, of psychasthenia. If he had correctly understood the misgivings of the speakers who have preceded him as to the descriptive adequacy of the term psychasthenia he would say that such misgivings are superfluous. Psychasthenia, as he interpreted it, is meant to cover that peculiar syndrome of fears, obsessions, tics, mental crotchets, doubts, interrogations, etc., which marks the first step downward from the level of normal mental health. This psychasthenic state may be recovered from, the normal level of mental health regained; it may persist as a clinical entity, or it may simply serve as a point of departure for any one of the well-known forms of psychosis. The factor which mainly determines the issue in any given case is, to his way of thinking, heredity.

Dr. Knapp said that the juxtaposition of the titles "*The Partial Passing of Neurasthenia*" and "*The Coming of Psychasthenia*"—a sort of "*Le roi est mort, vive le roi*," suggests the demise of an old and valued friend—but yet he was not wholly ready to give up neurasthenia. Mere names are of less importance than theologians, metaphysicians and lawyers claim, and he would not contend particularly in behalf of neurasthenia as against psychasthenia, were it not that the latter word implies certain doctrines which are erroneous. If applied generally, as is so often done, although the present speaker has avoided that even, it implies that neurasthenia has a psychical basis and a psychical origin. This is often not the case. Neurasthenia is a fatigue neurosis, and many of its symptoms, as Fleury has shown, are purely physical, and have no psychical character. There are

many neurasthenics who are simply "born tired," and in many instances the most careful investigation, even daily intercourse, can discern nothing but the symptoms of fatigue, easy exhaustion and incapacity for protracted effort, but no sign of obsession, questionings, scrupulosity, phobia or other mental abnormality. In other cases a phobia may develop secondarily as a result of weakness—the patient is conscious of his inability to perform some act and dreads the consequences of failure.

Psychasthenia is furthermore objectionable, as it implies conditions of mental weakness or fatigue, whereas these morbid conditions of fear and obsession may develop in the predisposed without any real weakness or exhaustion, but as a mental perversion, akin to the delusions of the paranoiac.

Dr. Knapp attempted to show some years ago that many of these morbid fears and mildly insistent ideas were of common occurrence in healthy persons, and he showed how, in one case, the fear of a height increased with the fatigue of the winter's work. Hypochondriacal ideas are of common occurrence; they develop frequently as a result of the disturbing symptoms and weakness of neurasthenia, but in other cases they may develop *de novo* in a systematized form and form one manifestation of paranoia, as Dr. Elliot showed years ago in a paper read before this Society.

The diagnosis of neurasthenia is often made carelessly, and the term is used loosely, but the condition is real and the term cannot be abandoned. The substitution of "psychoneurosis" would be a diagnostic help, but it would apply to every disease of the nervous system and save the trouble of making any diagnosis at all. It would be more all-embracing than the alienist's stand-by, dementia præcox. The prognosis is not always dependent upon the severity of the symptoms. The cases with mild symptoms are sometimes very obstinate. The reason for this is not clear, but it certainly is not due to bad heredity. The data as to defective heredity are so uncertain and the former teachings are so much in need of thorough scientific investigation that we can make few claims in regard to it.

Dr. Cowles said that the subject of Dr. Blumer's paper was exceedingly interesting, and timely in its harmony with the present tendency to functional conceptions of pathology. Some present remember well when it was the fashion in psychiatry to discover new disease-entities with new names, and extreme views were held of the essential importance of heredity and physical degeneracy, and of structural explanations, that are likely to become better understood. Such a change toward the study of functional modifications, as Dr. Blumer indicates, appears to be coming in psychiatry.

The modern tendency to the unification of "disease-forms" was anticipated by Griesinger in his recognition of the essential unity of melancholia and mania, and his use of those terms descriptively as designating "states of mental depression" and "states of mental exaltation." The acceptance of Kraepelin's views in regard to "maniacal-depressive" insanity, as a distinct though composite "disease-form," shows the same tendency. It is in this connection that Janet's conception of psychasthenia has a special interest. His studies of the minor and apparently diverse psychoneuroses during the past fifteen years have had great influence, though it has not been especially felt in psychiatry until recently. The general and special insufficiency that he finds to be the common fact in all these phenomena, and describes as psychasthenia, has associated with it another significant fact; he shows that there is a regular gradation of reductions of functional power from the smaller to the greater losses of efficiency. This principle of reduction being fundamental to Janet's conception, it is important also to note that his conclusions were based upon psychological analysis. While psychasthenia represents the psychological aspect of the insufficiency it is, as he says, at the same time neurasthenia; psychasthenia on the mental side represents neurasthenia on the physical side. In this way, with better understanding, neurasthenia is becoming more and more merely a descriptive term for a wide range of conditions of nervous weakness; no wonder that

its early significance as a disease-entity is passing. It is sharing the fate of melancholia and mania; all these words, including psychasthenia, being no longer names of diseases in their proper meaning, have their descriptive sense best expressed by the adjectives psychasthenic, neurasthenic, etc.

Psychasthenia, it seems to Dr. Cowles, is a useful and welcome addition to the vocabulary of psychiatry; in its use there is a definite recognition of a functional conception of the conditions of psychical phenomena. While there can be no psychosis without a neurosis, nor psychasthenia without neurasthenia, and though neither of these is a disease, yet the word psychasthenia as a formal designation of what we knew before, gives a new and important significance to the purely psychical aspects of modifications of mental function as symptoms. It means, as a common fact, that all psychical functions may manifest insufficiency in Janet's sense of the word psychasthenia. The importance to psychiatry of this principle that psychical insufficiency always has a neurasthenic basis is shown in its application to the functional insanities; in these insane psychoses, if the mental symptoms are all considered as psychasthenic reductions of efficiency representing a neurasthenic physical basis, then the essential unity of the conditions of all these functional phenomena appears. Their differentiation into named symptom-complexes would no longer be required nor consume time and labor, and melancholic and maniacal states could be consistently regarded and described as always fundamentally both psychasthenic and neurasthenic. This would simplify the whole conception of functional insanity, and make consistent its many "states" and "forms" as manifestations of various degrees of reduction of physiological integrity.

Periscope

Archiv fuer Psychiatrie und Nervenkrankheiten

(40, 1905, No. 1.)

1. One-Sided Brain Atrophy in An Idiot Having Infantile Cerebral Paralysis. M. KÖPPEN.
2. Concerning Periodic Paranoia and the Genesis of the Paranoid Delusions. GIERLICH.
3. Contribution to the Pathological Anatomy of Early Isolated Paralysis of Ocular Muscles. E. SIEMERLING.
4. Appoplectiform Neuritis. A. WESTPHAL.
5. Cysticerci with Special Reference to the Cysticercus Racemosus of the Brain. R. WOLLENBERG.
6. Beer Delirium. HANS GUDDEN.
7. Development in the Construction of the Nurses' Quarters of the Private Institution at Ilten. RUDOLPH WAHRENDORFF.
8. Contribution to the Study of Hysterical Insanity. RAECKE.
9. How Can We Secure the Curative Effect of Institutions for Nervous Disease? MAX LAEHR.
10. "Funicular Myelitis" (Combined System Degeneration). R. HENNEBERG.
11. The Psychical, and Especially the Disturbance of Intelligence in Multiple Sclerosis. SEIFFER.
12. A Case of Acute Superior Hemorrhagic Polioencephalitis and a Chronic Case of Korsakow's Psychosis. J. BOEDEKER.

1. *Brain Atrophy*.—Köppen refers to the fact that many disease processes finally lead to deformity of the brain, which, on its clinical side, presents the picture of idiocy. He describes two cases at length of unilateral brain atrophy in idiots without apparent definite cause, and draws the following conclusions from his study: The first was a hemiplegic idiot, with unilateral atrophy of the right hemisphere as a probable consequence of a circulatory disturbance in the short and long cortical vessels. There were three grades of disease: Lesions with a coarse neuroglia network; areas with an increase and thickening of the capillary network, and finally merely a destruction of the tissue. The longer tracts were better preserved than the shorter. The right-sided atrophy of the hemisphere was associated with much hydrocephalus, atrophy of the right red nucleus, the left middle cerebellar peduncle and the left cerebellar hemisphere. The second case was an idiot with right-sided hemiplegia and a diminution in size of the left hemisphere, particularly in the frontal lobe. The hemisphere showed no atrophy, but merely a general diminution of its substance. The tangential fibers were located unusually deep in the cortex. The primary disease appeared to be in the central ganglia, and particularly in the corpus striatum. An irregularity of nerve fibers is attributed to a healed pathological process.

2. *Paranoia*.—After alluding to the fact that paranoia remains one of the most important branches of psychiatric research, the author discusses at great length and with numerous references to literature the varying opinions which have been entertained regarding the character of this affection. Cases are quoted, several at much length, by way of illustration.

The author does not agree with previous writers on this subject, and attempts an elucidation of his theory of the formation and development of the delusional state.

3. *Ocular Paralysis*.—On the basis of a carefully observed clinical and post-mortem case Siemerling discusses the question of the innervation of the ocular muscles. The essential features of the case were a total right, external ophthalmoplegia with complete ptosis, occurring in a woman of fifty-five; limitation of movement of the left eye in the distribution of the oculomotor nerve, especially upward, somewhat less inward and downward. Movement outward was well preserved. There was ptosis of moderate degree which was diminished somewhat by special effort. There was no nystagmus and the fundus was normal. On the basis of this clinical case, afterwards studied microscopically, Siemerling draws conclusions of interest regarding various matters concerning the pathological anatomy of these conditions, and also regarding the nuclear representation of ocular muscles. His general conclusion is that the results of investigations such as this should lead to the greatest caution in regard to definite localization of muscular movement. Owing to the extensive implication of the posterior longitudinal bundle, it is assumed that this structure stands in the closest relationship to the nuclei of the ocular muscles.

4. *Apoplectiform Neuritis*.—On the basis of a carefully studied case, both on the clinical and pathological side, Westphal discusses the question of apoplectiform neuritis. A woman suffering from senile melancholia, at the conclusion of a double pneumonia developed a delirium, during which an apoplexy came on involving the right arm. Electrical examination showed a quantitative diminution without reaction of degeneration. There was also hyperesthesia and hyperalgesia of the skin of the affected arm. The legs showed slighter symptoms. The anatomical investigation showed a parenchymatous neuritis of the nerve trunks of the right arm, with slighter changes of the brachial plexus. There were also degenerative changes in the muscles. Changes in the spinal cord consisted in a recent internal pachymeningitis and alterations in certain of the nerve cells of the ventral horns in various parts of the spinal cord. The case is of interest on account of its sudden onset, having as its essential basis a severe parenchymatous neuritis of the nerves of the right arm. A detailed discussion of this case follows with the extensive reference to the literature.

5. *Brain Cysticerci*.—Wollenberg has been able to collect six observations on the subject of cysticerci of the brain. The difficulty of diagnosis is dwelt upon, due naturally to the various positions which the parasite may occupy in the brain. Light may be thrown upon the diagnosis through finding evidence of cysticerci in other parts of the body. Two general classes of cases may be distinguished, those in which the cysticerci lie free in the fourth ventricle, and others in which the cysticercus racemosus occurs at the base. The cases are described and discussed at length, together with the relationship between the clinical symptoms and anatomical alterations.

6. *Beer Delirium*.—Gudden in this paper takes up the interesting question of the mental disturbances which may follow the over use of beer as distinguished from other beverages containing a larger percentage of alcohol. Consequent upon the study of a series of a thousand cases of mental disease, Gudden has reached the conclusion that the excessive use of beer is not harmless as ordinarily supposed, but that it may lead, if it be united with a small amount of a stronger alcoholic beverage, to the psychic alterations of chronic alcoholism. In two cases he was able to observe the development of an hallucinatory alcoholic delirium through the use of beer alone. These two cases are reported in the greatest detail. In the study of these two cases the further observation was made that in addition to the long continuance of the beer delirium there was superadded an apprehensive form of sense falsification.

7. *Nurses Quarters*.—This paper concerns itself merely with the details of hospital construction, and should be of interest to those who are concerned with modern methods of the care of patients in private institutions.

8. *Hysterical Insanity*.—Raecke's article begins with the statement that hysteria is essentially a mental disease. He discusses hysterical depression, hypochondriacal conditions, attempts at suicide, which latter he thinks are by no means so harmless as ordinarily supposed, the so-called *furor hystericus*, conditions of maniacal exaltation, and other types of mental disorder, with brief reference to illustrative cases. The article in general represents the collection of opinions of others, together with a critical analysis of the entire mental state found in hysteria. It may serve to throw some added light on a dark subject.

9. *Institutional Care*.—Laehr takes up the very important question of the proper care for those forms of nervous disorder wherein a cure cannot be expected. In behalf of institutions he is of the opinion that many patients who are suffering from severe mental disorder do not properly belong in the institutions for nervous disease, inasmuch as they are not suffering from transitory nervous derangement. In the interest of the institutions he is of the opinion that a distinction should be made if the institutions are to perform their best work. A sharper distinction should be made between patients who require merely care and those for whom distinct benefit may result by hospital treatment. The article concerns itself, therefore, with a question of classification, always a difficult matter to adjust satisfactorily.

10. *Funicular Myelitis*.—After calling attention to the wide diversity of the pathological findings in the so-called combined system disease of the spinal cord, Henneberg describes four cases, both clinically and pathologically. He dwells upon the difficulty of making a sharp distinction between true systemic degeneration and degenerations which are not, strictly speaking, limited to definite fiber tracts. Cases are given in detail with illustrations of the lesions, and somewhat inadequate reference to the work done by others on the subject. The difficulty of properly naming the condition under consideration leads him to use the term "funicular myelitis," or if the term myelitis be objected to "funicular myelomalacia." Whether or not this nomenclature adds to the clearness of an already obscure subject must be left in doubt. The cases are apparently of the usual type of diffuse combined degeneration.

11. *Mental Symptoms in Multiple Sclerosis*.—Seiffer offers an interesting discussion on the disturbances of intelligence in multiple sclerosis, basing his research on ten cases. In all of these cases, with the exception of one, there were more or less distinct disturbances of intelligence, most frequently observed in the field of memory, both of early and late events, and in the association of ideas. Abstract conceptions and attention were far less involved. A further observation was made that in a large proportion of the patients there was a certain slowing of the time intellectual processes. Although such mental defects are not absolutely constant in multiple sclerosis, the writer believes them to be exceedingly frequent. The euphoria has long been recognized, and attention is drawn to the difference between this condition and the disturbances common in dementia paralytica. The paper is a valuable discussion of the subject.

12. *Polioencephalitis Acuta*.—Boedeker reports two cases; the first of which might also be considered as a superior hemorrhagic polioencephalitis, and the second a chronic case of Korsakow's psychosis, with special reference to the late results of the disease. The cases are reported in detail, and are an addition to the increasing literature of the general disease-complex brought forward originally by Korsakow.

E. W. TAYLOR (Boston).

American Journal of Insanity

(52. 1905. No. 1.)

1. The Insane in Canada. T. J. W. BURGESS.
2. Study of Mental Diseases Associated With Arteriosclerosis. A. M. BARRETT.
3. Korsakoff's Psychosis. A. W. HURD.
4. A Case of Visual Hallucinations and Crossed Amblyopia, With Vascular and Degenerative Lesions in the Calcarine Cortex and Other Portions of the Occipital Lobes, Also With Atrophy of the Pre-geniculae and Optic Tracts. CHARLES K. MILLS and C. D. CAMP.
5. Cytodiagnosis in Psychiatry. C. B. FARRAR.
6. Extension of Tent Treatment to Additional Classes of the Insane. C. F. HAVILAND and C. L. CARLISLE.

1. *The Insane in Canada* (the Presidential Address delivered at the San Antonio meeting of the American Medico-Psychological Association, April, 1905).—The author reviews the development of the care of the insane in Canada, and emphasizes what he considers the most crying needs in that country at the present time. His causes for complaint do not seem different from those which exist in many of our own States, being in the main lack of special institutions for the feeble minded, and for the criminal insane, overcrowding, and the intrusion of politics into the question of appointments and into the business of the asylums.

2. *Mental Diseases Associated with Arteriosclerosis*.—The author selects four cases from the Danvers Asylum as examples of insanity associated with arteriosclerosis, and compares them with sixteen cases of arteriosclerosis associated with senile dementia. He does not find the four groups of arteriosclerotic insanity described by Alzheimer in 1902 at all common. Anatomically two processes are to be considered, the disease of the vessels and the reactions in the nervous tissue proper. In the vessels the intima is chiefly involved, the cells proliferating and its thickness being increased, the elastic coat also increases in thickness. The process is apt to extend to the very fine vessels. The changes in the nervous elements cannot be regarded as specific. The nerve cells show various forms of degeneration, and there is tendency to glia proliferation. The characteristic feature of arteriosclerosis in the cortex is its focal distribution. The foci vary greatly in size. From general paresis, arteriosclerotic brain disease is to be differentiated by the less diffuse character of the process, and above all by the absence of lymphoid and plasma cell infiltration of the vessel wall; from senile brain atrophy by its focal distribution, and by the evident relation of nervous tissue degeneration to vessel changes, in arteriosclerosis the degeneration being patch-like, in senile dementia the nerve cell disappearance more diffuse. The four cases analyzed, and another whose description is omitted showed the following symptoms. Weakness of retentive memory was the earliest symptom noticed, while comprehension and orientation were preserved for some time. Hallucinations were present in three of the cases, but were episodal and not well marked. All showed dullness in association. Episodal, ill-marked delusions of persecution were present in three cases. The mood variable at the start tended to apathy later. The end stage was profound dementia. Four cases showed the influence of heredity, two had used alcohol moderately, and one had probably had syphilis. Each case had marked physical disturbances. Four had heart murmurs, three showed arteriosclerosis of the surface arteries. In three cases in which the urine was examined, there was evidence of nephritis. Four showed speech difficulties. All had at some time epileptiform or apoplectiform attacks. The reflexes were normal in three, exaggerated in one, and lost in one case. The pupils were normal in three cases, unequal in two cases, and reacted sluggishly in one case. On post-mortem examination all showed general arteriosclerosis, interstitial nephritis and chronic leptomeningitis. Gross

atrophies of the convolutions were absent. All but one case showed cysts, focal hemorrhages or softenings, always small. The fine cortical vessels showed varying degrees of arteriosclerosis with multiple focal degenerations of the nervous tissue, and glia proliferation. The differential diagnosis from general paresis may present considerable difficulty as the two classes of cases have many symptoms in common. In general paresis the delusions are usually more prominent, and euphoria is more apt to be marked. Loss of pupillary light reflex is rare in arteriosclerosis, and the knee jerk is apt to be exaggerated, though not always. Marked arteriosclerosis elsewhere is an important diagnostic aid. The largest group of cases of arteriosclerotic brain disease is that in which there is more coarse destruction of brain tissue from hemorrhage and softening. An account of one such case with autopsy findings is given for comparison. Senile dementia and arteriosclerotic disease are often associated and it seems difficult to determine their exact relations. The anatomical changes differ from those described only in being associated with senile brain atrophy. Clinically the picture consists in gradually increasing change of character with forgetfulness, confabulation, loss of judgment, disorientation, narrowing of external interests, episodes of confusion and hallucination delirium, and delusions of persecution and suspicion, the end being deep dementia. This picture corresponds also to that of senile dementia, but we have in addition the focal symptoms of arteriosclerosis, as shocks, paralysis, articulatory speech defects and aphasia.

3. *Korsakoff's Psychosis*.—Arthur W. Hurd reports five typical cases of this psychosis, all with a history of chronic alcoholism, and having multiple neuritis. Four of the subjects were women, one a man seventy-one years old. Two cases recovered, the others remained unimproved. The author finds the symptom-complex more or less clearly cut and usually recognizable, and believes that with persistent and intelligent care and treatment the prognosis may be made better than it has generally been considered.

4. *Visual Hallucinations and Crossed Amblyopia, With Vascular and Degenerative Lesions in the Calcarine Cortex and Occipital Lobe*.—The patient was a woman sixty-three years old, had suffered some impairment of vision from glaucoma two years before coming under the author's observation, vision being O.D. 20-40, O.S. 20-50, visual fields nearly normal, discs slightly cupped on both sides. Three months before her death she had a seizure of some sort, became completely blind in the right eye, while in the left eye the visual field was greatly contracted, lost power of coördinating her movements sufficiently to stand, was delirious and excitable. She remained mildly excited for two weeks, then grew violently excited, had visual hallucinations, saw men assaulting her son and husband, and threatening her. She also had illusions mistaking doctor and nurse for those who threatened her. There were no auditory hallucinations. She became progressively more incoherent, and died under symptoms of exhaustion. The gross pathological findings were chronic mitral and aortic disease, cardiac hypertrophy, with some fatty degeneration of the heart muscle, bronchopneumonia, fatty liver and chronic interstitial nephritis. The brain showed sclerosis of the basal arteries and atrophy of the pregeniculae. Microscopical examination showed pigment deposit in, and irregularities of the processes of the cells of Betz. In sections from the calcarine region of both sides there was intense congestion, with formation of numerous new capillaries and degeneration of the nerve cells in their vicinity. Similar changes were found in the cortex of the lateral surfaces of the occipital lobe near the occipital pole. The white substance of both these areas stained by Weigert's method showed degenerated nerve fibers. The left optic nerve was only about one-third its normal size and showed great connective tissue overgrowth. The chiasm showed degeneration.

5. *Cytodiagnosis in Psychiatry*.—A résumé of the methods of obtaining and examining the cerebro-spinal fluid, its composition in normal and pathological conditions, with the diagnostic inferences to be drawn from it,

also the therapeutic uses of lumbar puncture and its contraindications.

6. *Tent Treatment*.—Tent life applied to the tuberculous having proved so satisfactory at the Manhattan State Hospital it was determined to try it during the milder months of the year in some additional classes, notably for the feeble and helpless, and for certain convalescents. The greatest benefit was found to accrue to a class of convalescents observed in every hospital; namely, those who are seen to be returning to normal condition, but in whom entire recovery is delayed, their physical conditions often remaining unsatisfactory, and it is proposed to apply tent life to this class in future. The feeble and helpless also do well in tents. The authors give also some additional facts with regard to the tent treatment of the tuberculous, with description of the arrangement of tent statistics as to gain in weight, etc. Even during the severe winter of 1904-05 it was found possible to keep the tents comfortable by the use of stoves. In fact the tuberculous patients made greater gains in physical condition in winter than in summer.

ALLEN (Trenton).

Psychiatrisch-Neurologische Wochenschrift

(July 15, 1905.)

1. Improvement Following Transfer. FRANZ RIKLIN. (Continued.)

(July 22, 1905.)

1. Improvement Following Transfer. FRANZ RIKLIN. (Continued.)
2. Cervantes. BÉLA RÉVÉSZ.
3. Neuronal. BRESLER. (Continued.)

2. *Cervantes*.—Cervantes' novel, *Don Quixote*, is an example of suggestive influence upon a national literature. The literature of Spain up to 1605, when it appeared, was in a state of stagnation, but almost immediately after its publication numerous works of fiction appeared dealing more or less with similar themes.

(July 29, 1905.)

1. Neuronal. BRESLER. (Concluded.)
2. Improvement Following Transfer. FRANZ RIKLIN. (Concluded.)

1. *Neuronal*.—From observations made in the use of this drug the author concludes that given in good sized doses under conditions favorable for sleep it is useful hypnotic, especially as it has recently been shown that it is free from cumulative effects.

2. *Improvement Following Transfer*.—The studies recorded in this article were made in connection with the opening of four pavilions at the institution at Rheinau for the accommodation of 220 patients of the chronic classes. Of eighty-five cases specially observed over one-half showed improvement of varying duration. Proper employment was thought to be an important factor in this improvement. A certain few cases, however, do not follow the rule, but after a period of improvement developed an acute attack, followed by marked deterioration.

(August 5, 1905.)

1. The Fiftieth Anniversary of the Private Hospital for Nervous Diseases at Görlitz (with plan). DR. S. KAHLBAUM.

1. *Fiftieth Anniversary of Hospital at Görlitz*.—Merely a short article descriptive of the hospital, with a ground plan showing location of the different buildings, etc.

(August 12, 1905.)

1. The Effects of Griserin. SPERNBERGER.
2. A Course of Medical Psychology With Relation to the Treatment and Education of the Congenitally Weakminded for Physicians and Pedagogues. SOMMER.

1. *Effects of Griserin*.—The author used this drug in the treatment of

eleven cases of tuberculosis. As a result of his work he concludes it is not altogether harmless. He cannot recommend it, as several of the cases appeared to be made worse by its administration.

2. *Treatment of Weakminded.*—A plea for the training of physicians and teachers who have to do with the weakminded in medical psychology in relation to the psychopathology of children.

W. A. WHITE (Washington).

Journal de Psychologie, Normale et Pathologique.

(Vol. 2, 1905. No. 3. May-June, 1905.)

1. An Essay Upon Colored Audition and Its Esthetic Value. ROSSIGNEUX.
2. The Illusion Commonly Known As "False Recognition." DROMARD and ALBES.
3. The Hypochondriacal Mental Preoccupation of Syphilitics in Regard to General Paresis. ROY.
4. Changeable Sexual Obsessions. CH. FÉRE.

1. *Colored Audition.*—This is an entertaining essay, with numerous illustrations from the poets, upon the esthetic value and the psychological reasonableness of the application of terms and ideas that primarily belong to the sense of color to that of hearing.

2. *False Recognition.*—One of the authors of this long and exhaustive study of the psychology of this condition was himself the victim of it, and gives in detail an interesting statement of its autoanalysis. The study is historical, critical and suggestive, and therefore too long to be abstracted in full. In his self-analysis the writer states that this peculiar mental aberration would come on most unexpectedly when he was in the midst of trifling occupations and without any apparent cause. Its onset never coincided especially with any particular event, or period of overwork, or prolonged wakefulness or state of fatigue. On the other hand, it appeared when his attention was given simultaneously to some external object and internal thought; as for example, when he was listening to a conversation while following his own personal ideas. This piecing of the attention, as it were, this double thinking was like thinking upon two things at the same time. The phenomenon would rise to its climax most rapidly, and would give him the impression of a complete cessation of all activity, while at the same time it caused him to lose for a moment the idea of an external world. There seemed to be a total eclipse of all psychic working from the outside view. One would have believed that he was buried in profound thought or minute observation. If one abruptly aroused him and asked, "What are you thinking of?" he would invariably give this truthful reply, "I am thinking of nothing." When the phenomenon came on gradually, a more rare condition, the impression it gave him was not then one of "not living," but of having "lived formerly or elsewhere." In the beginning his personality seemed to isolate itself from the external world and detach itself from its environment. Life seemed to float about him, and all the sensations which came to him were indifferently perceived, and upon the same plane like the transparencies which an impalpable curtain prevented his touching or coming in contact with. "Gradually I withdrew into myself, so that I could behold myself seeing and listen to myself hearing. It seemed to me then that I was at the same instant two individuals, one of whom acted automatically, while the other gazed at the actions of the former. The second individuality attended every performance of the first just like a disinterested spectator. At this same moment there occurs a sort of decline. It seems to me that a veil has been rent. I am about coming out of a dream, or more correctly, something which I cannot define, says that my dream is indeed a reality. Only this reality is not characterized by any sort of novelty. It is a familiar reality, a recognized reality, whose presentation seems to me to have been preformed, whose imprint seems to exist within me as the imprint of a past acquisition. My present situation appears to me

to be the repetition of some prior situation. I believe that I am positively living over again some earlier period in my life. The illusion is integral. I would say that the feeling which I experience does not correspond to a simple one of menanology, but to one of perfect identity. I do not merely recognize things. I find myself experiencing the same mental disposition and spirtial feelings that I had in the imaginary past two which I adapt the present.

"Indeed, I exercise the power of *recognition*, but my judgment in regard to the recognition has something very particular about it which I believe I may define in the following way: When I perform a normal or legitimate recognition I have the impression that the present reality has its *double*, and I place without hesitation *this double* in the past. Here, however, on the contrary, I have the impression that the present reality has its *double*, but *this double* I have no more reason for placing in the past than in the future. It seems to me that I have already seen and heard all of these things that I see and hear, but this feeling comes to me, so to say, before even the seeing and the hearing of them. The truth is, that at the moment when actual, real phenomena touch my consciousness these phenomena appear to well up at the same time from the unknown depths of my mind. A virtual *double* seems to accompany their reality, but this virtual *double*, I cannot say exactly whether I ought to call it a *recollection* and not also a *foresight*."

After an exhaustive study and examination of the various theories propounded to explain this curious form of illusion, the authors conclude that it depended upon *an automatic fixation of the actual representations or perceptions on the one hand, and the application of a conscious activity to these representations or perceptions on the other*. These conditions are obtained in certain states of distraction, when these states lead in a subconscious manner to a sort of "invagination of the attention," instead of terminating purely and simply in a return to a normal mental activity.

3. *Hypochondriacal Preoccupation Among Syphilitics*.—This is an autobiographical account of a physician who, having acquired syphilis and manifested a few suspicious symptoms, became possessed of the idea that he was the victim of dementia paralytica. The author of the article indicates how he convinced himself of the baselessness of his fears and incidentally protests against the popular portrayal, in romances and the drama, of general paresis being the result of syphilis, when the etiological importance of the latter is so much under debate in scientific circles. In an attached note he says that while Fournier, who sees so many syphilitics, considers that "the two real causes of general paresis are syphilis and insufficient anti-syphilitic treatment," Joffroy, who sees so many general paralytics, thinks that "general paralysis and syphilis are two distinct affections, each having their own individuality, their own constitution, and that one in no way engenders the other; they are entirely different in nature."

4. *Changeable Sexual Obsessions*.—Féré reports the case of a man, sixty-four years of age, who was possessed of certain variable obsessions in the sexual sphere. There were no mental symptoms outside of these obsessions nor any neuropathic manifestations, not even a symptom of neurasthenia. But there was a tardy development and, the sexual instinct was only rarely manifested, though it was clearly proved that the man was not sterile. It was plainly demonstrated that his obsessional ideas in connection with the sexual instinct did not necessarily coincide with any physical excitation. There were transitory disappearances of the obsessions. These periods of rest, the author thinks, deserve to be particularly noted.

METTLER (Chicago).

Journal de Neurologie

(X. 1905. No. 9.)

1. Vertigo Due to Adhesions Between the Orifice of the Eustachian Tube and the Posterior Wall of the Pharynx. By DR. ROYET.

1. The author thinks that in probably the majority of instances the symptom of vertigo is of aural origin. This may be the case even when there are none of the usual symptoms of ear disease. In many of these cases he believes that careful examination will show adhesions between the mouth of the Eustachian tube and the posterior wall of the pharynx, which, interfering with the function of the ear, in some not very well explained way, produce the sensorial disturbance familiar to us as vertigo. The breaking up of these adhesions he finds a comparatively simple operation, accomplished by the finger alone, and followed generally by relief of the vertigo. It often has a favorable result, even in cases in which symptoms of organic disease of the nervous system with which vertigo is often associated are present, but in which salpingo-pharyngeal adhesions are also found.

(X. 1905. No. 10.)

1. An Anomaly of the Sexual Instinct, Gerontophilia. By CH. FÉRÉ.

A note on the case of a young man, the only child of consanguineous parents, whose sexual appetite could only be aroused in the presence of elderly women, those well preserved and lively, but having gray hair preferred. Young females excited in him only disgust and the author was consulted on account of abhorrence on the part of the patient for a marriage with a young and beautiful girl, which his parents desired him to make. In his relations with his elderly mistresses he was accustomed to stimulate desire by abnormal contacts. The author makes a bad prognosis in this case, and thinks sexual perversions appallingly frequent.

2. Hypothermia in a General Paretic. By L. MARCHAND and L. OLIVIER.

An account of the case of a general paretic, in whom, starting four days before death at 36 C. (in the rectum), the temperature fell by lysis until it marked 30 degrees shortly before death. The urine was normal and there was no sign of intercurrent disease. The autopsy showed a typical meningoencephalitis, with sclerosis in the lateral and posterior tracts of the cord. The authors consider the phenomenon as due entirely to the affection of the nervous system. They append a bibliography of the subject.

(X. 1905. No. 11.)

- Dementia Præcox in Its Relations to Progressive Systematized Delirium.

By E. MARANDON DE MONTYEL.

The author, an uncompromising opponent of the dementia præcox conception of Kraepelin, here combats the conclusions drawn by Deny, a Kraepelin partisan in his report on dementia præcox at the congress of Pau. He especially attacks the placing under the head of dementia paranoïdes those cases characterized by the progressive development of systematized delusions, the "délire chronique à évolution systématique" of French authors, which he insists have little tendency to dementia, any decided mental deterioration not appearing until very late in the disease, and then often being due to some added brain affection. He takes up the arguments of Deny one by one, and insists that the conception of a psychosis whose characteristic is a rapid destruction of the function of association—as urged by Deny—is incompatible with the building up of a delusional system, which, though starting with false ideas, is sustained by sharp and logical reasoning the clinical picture observed in chronic delirants.

(X. 1905. No. 12.)

1. Lesions of the Neurofibrils in Certain Pathological Conditions. By G. MARINESCO.

The author, who has already made a number of investigations on the neurofibrils, describes some additional findings in cases of myelitis, meningitis, and cerebral softening, and the changes occurring in the cells of Betz

in hemiplegias and paraplegias. He distinguishes what he calls granular disintegration from granular degeneration of the fibrils, the former milder and capable of regeneration, the latter an irreparable change. These changes may effect the fibrils both within and without the cell, but his findings indicate that the process of degeneration begins most frequently within the cell. The fibril change may or may not coincide with changes in the tigroid as shown by Nissl's method, but there is every reason to believe that both changes are parts of a general process. In cases characterized by swelling and displacement of the nucleus, the intracellular network is nearly always more or less disintegrated. The changes which he has observed are illustrated by a number of cuts. In the latter part of the article the author disputes the views of Dagonet, who has affirmed that the neurofibrils persist in general paresis, stating that the findings of himself and a number of other observers indicate that directly the contrary is the case.

(X. 1905. No. 13.)

1. A Case of Abarticular Atrophy. By A. DEROUBAIX.

1. The author describes the anatomical findings in a demented patient seventy-two years old, who had an ankylosis of the right knee joint dating back to childhood, with atrophy of the muscles of the lower extremity. He found marked diminution of the size of the fibers of the affected muscles with increase in number of the muscle nuclei. In the peripheral nerves nothing abnormal was noted. In the spinal ganglia there was dilatation of vessels, and great irregularity in staining of the cells. In the sacral cord the cells of the anterior horns were normal, but in the posterior horn on the right side, and especially in the intermediate zone, cells showing chromatolysis and displacement of the nuclei were found. Profound alteration of the cells and increase of neuroglia with thickening of vessel walls was found in the cerebral cortex. The author thinks this case sustains the view first advanced by Brown-Séquard, that atrophy consecutive to joint disease takes place through irritation following the reflex arc, but not that through the motor cells of the anterior horn, but rather through the sympathetic, which he thinks regulates the trophic functions, and whose origin he places in the cells of the region intermediate between the anterior and the posterior horn. These cells showed chromatolysis in the case described. The arteriosclerosis which was also present, however, would seem to make the interpretation of these changes somewhat doubtful.

(X. 1905. No. 14.)

1. Continued Alcoholic Delirium, or Continued Hallucinoses in Chronic Alcoholism. By S. SOUKHANOFF.

The author describes a condition of continued hallucinations, mainly auditory, to a less extent visual, occurring in chronic drinkers. It may have an acute or a chronic onset, in the former case, much resembling that of delirium tremens, and is sometimes, though not necessarily, connected with disease of the auditory apparatus. In cases beginning acutely, the diagnosis from delirium tremens is difficult, and may be impossible. The predominance of auditory hallucinations, and especially a fixity of their content, points rather to continued hallucinoses. The disease is in the majority of cases incurable, but the content of the hallucinations gradually tends to become less disturbing, though there is liability to exacerbations from time to time. In the author's conception this chronic alcoholic hallucinosis does not coincide with the acute hallucinosis of Wernicke and of Bonhöffer, the "Hallucinatorische Wahnsinn" of Kraepelin, or the alcoholic paranoia of Mendel and of Serbsky. He also calls attention to the fact that chronic auditory hallucinosis may occur apart from alcoholism, in cases of lesions of the peripheral auditory apparatus, and sometimes in senile arteriosclerotic individuals. The condition which he describes is illustrated by the history of a typical case, which was under observation for several years.

2. A Case of Thomsen's Disease. By FR. MEEUS.

Report of a case of this rare disease in a man nineteen years old, in

which the author signalizes specially the following points: 1. The absence of direct heredity. The father was alcoholic, the mother of a neurotic family, three maternal aunts being afflicted with periodic psychoses, but no history of myotonia in any other members of the family could be obtained. The author thinks this an instance of transformation of neurosis. 2. There was in this patient absence of the principal reflexes, the pupillary reaction alone persisting feebly. 3. The patient was not prevented by the disease from carrying on his occupation, that of a joiner; and sought medical advice only to procure a certificate of exemption from military service.

(X. 1905. No. 15.)

Devoted to Report of the Proceedings of the Congress of Alienists and Neurologists at Rennes.

(X. 1905. No. 16.)

Note of a Case of Infantile Myxedema, With Some Considerations on the Pathogeny of Myxedema. By A. OBREGIA, C. PARHON and ST. FLORIAN.

Sketch of a case of myxedema in a twelve-year-old girl, with remarkable improvement under the administration of thyroid gland. In a year the undersized patient grew nearly 18 cm. in height. The authors take occasion to discuss some points in the pathogeny of this disease. The urine in myxedema has been found to contain excess of calcium salts, and thyroid therapy has been shown to remarkably increase the retention of lime in the organism. These facts, they think, show that normally the thyroid gland has to do with the retention of calcium, hence lack of growth of the bones when its function is in abeyance, and the remarkable increase in their length under the administration of thyroid. The "reduction of organic combustions" they think explains the frequent adiposis, also the subnormal temperature observed in myxedematous subjects. Failure to properly elaborate iodine and arsenic on the part of the thyroid gland would explain the poverty of the hair, which might also be due in part to lack of lime salts. The absence of sweating and the psychological apathy are probably due to alteration in function of the nervous system dependent upon faulty nutrition, but about this we have no definite information.

(X. 1905. No. 17.)

1. Lumbar Puncture. By D. DE BUCK.

A comprehensive report on this subject prepared as an introduction to its discussion at the Belgian Congress of Neurology and Psychiatry at Liege, September, 1905. The author, with the assistance of Dr. Deroubiax, has carried out a number of researches upon the physical, chemical, physiological and bacteriological characters of the cerebro-spinal fluid, and their respective applicability to questions of diagnosis. He also considers lumbar puncture alone, or followed by the injection of various substances, as a therapeutic measure. His conclusions are summarized as follows: 1. The cerebro-spinal fluid is a secretion of the ependymal epithelium, especially of the choroid plexus. It is discharged into the lymphatic circulation either directly through the perivascular lymph channels or indirectly by diffusion. It gathers certain products of the disassimilation of the nerve centres, and can participate in the traumatic lesions and morphological reactions of these centres, especially of their envelopes. 2. As to physical characters the color gives the most important indications (blood, etc.). The study of the density and osmotic pressure are at present of more scientific than practical value. 3. The study of the chemical composition of the cerebro-spinal fluid has not so far furnished any considerable addition to our diagnostic resources. Presence of cholin and increase of phosphates speak to some degree for an organic affection. Increase in albumin points to an organic affection, especially to general paresis. The author could draw no diagnostic inferences from his determinations of alkalinity, chlorides and reducing substances, while search for acetone, bodies giving the diazo-reaction, ammonia and hemolysis resulted negatively even in severe organic psychoses. 4. The most important diagnostic inferences are furnished by

the cytological examination—e. g. lymphocytosis pointing to general paresis, leucocytosis to meningeal reaction. 5. The question of the permeability of the secreting membrane by the cerebro-spinal fluid needs for its decision further researches. 6. The toxicity of the cerebro-spinal fluid is feeble. 7. Bacteriological examination by cover glass preparations, cultures or inoculations may often make clear the nature of a meningitis. Psychiatry has, however, so far received little profit from such examinations. 8. From a therapeutic point of view, lumbar puncture and withdrawal of variable amounts of fluid may act favorably by relieving pressure and draining off septic or toxic material. It may be curative in some forms of meningitis. Puncture followed by injections of sera, medicaments of various kinds, and local anesthetics, undoubtedly seems to fulfill certain indications, but has hardly yet passed the period of probation.

(N. 1905. No. 18.)

Lumbar Puncture in the Child. By A. LEY.

Prepared for the discussion of the subject of lumbar puncture at the Belgian Congress of Neurology and Psychiatry for 1905. The author considers lumbar puncture especially as applied to the child taking it up under the following heads: 1. Special technique in the child. 2. Diagnostic values. 3. Therapeutic value. He summarizes as follows: 1. Lumbar puncture in the child may be considered as harmless if certain precautions are observed. In children under two years old, always puncture in the lumbo-sacral space. 2. The examination of the cephalo-rachidian fluid, both by the cytological and by the bacteriological methods, constitutes an important diagnostic aid, and should be practised by every physician. In meningeal inflammation it finds its chief application. 3. Puncture relieves and improves meningitic patients in general. It has a real curative value in hydrocephaly, and acute meningitis, and ought in these cases to be repeated frequently. 4. The harmlessness of lumbar puncture justifies its trial in diverse affections, among others in chorea, pertussis, eclampsia, uremia, deafness and incontinence of urine.

ALLEN (Trenton).

Miscellany

TWO CASES OF UNILATERAL CONVULSIONS AND PARALYSIS IN YOUNG SUBJECTS, WITH EXUDATIVE ERYTHEMA. By T. K. Monro (The British Medical Journal, May 27, 1905).

The first case was a boy, fourteen years old, who had a history of having had several attacks of rheumatism. The illness began on June 12, 1903, with pain and stiffness in the joints, followed by severe gastro-enteric symptoms. After a fortnight he began having attacks of right-sided convulsions and became unconscious. These ceased in another fortnight, leaving him with a right hemiplegia and aphasia. During that period a bedsore developed over the sacrum and linear atrophy of the skin took place in numerous areas about the thighs and knees. The temperature was sub-normal throughout. At an examination about a year later there was still a hemiparesis with partial aphasia. On December 26 he had a well marked attack of erythema nodosum, complicated by conjunctivitis. The author considers that this series of lesions points to a general infectious agent. The second case occurred in a girl eighteen years old, who was suddenly seized with attacks of right-sided convulsions, beginning in the arm, and these were followed by a right-sided hemiplegia. About six days after the onset of the convulsions she developed erythema multiforme. Three days later signs of returning power in the right side began to be noticed, but she still had headache and a convergent squint, due to paralysis of the external recti-muscles. An ophthalmoscopic examination showed an optic neuritis, which later subsided to some extent in the left eye, being followed by the pallor of consecutive atrophy. There is probably no constant lesion for cases of this kind, but the supposition is that the primary condition is thrombosis, which may or may not be infectious.

C. D. CAMP (Philadelphia)

AMAUROTIC FAMILY IDIOCY. M. Frank (Journal A. M. A., January 20).

Frank reports briefly a case of this condition, describes the characteristic fundus changes and reviews the literature regarding them. The characteristic ocular symptoms which remain unaltered through the course of the disease, consist in a nebulous grayish-white area surrounding the macula about three times the size of the disc, somewhat oval in shape, with the major axis horizontal, and gradually blending at the edges with the normal fundus. At its center, coinciding with the fovea but larger, is a clearly defined dark red or liver-colored spot. Surrounding this can be seen the tiny retinal vessels. Strabismus and nystagmus have been observed in some cases. There is no recorded regularity in the pupillary conditions. The other symptoms of the disease, the marasmus, the mental failure, and ultimate paralysis, together with the hereditary or family tendency are mentioned, together with the optic atrophy and blindness. Frank attributes the pathognomonic eye changes to swollen and degenerated ganglion cells rather than to an edema; the constancy of the phenomenon and the lack of veiling of the vessels are against edema. He summarizes the cases reported up to date, 54 in all, with 22 others referred to. Where race data were given the great majority are Jews. There have been 12 post-mortems, and in 6 cases the eyes were microscopically examined.

HYDROTHERAPY IN EPILEPSY. Guy Hinsdale. (Journal A. M. A., January 20).

The author reviews the literature regarding hydrotherapy in the treatment of epilepsy. In this country attention was first called to its value in this disease by Dr. Simon Baruch and the late Dr. G. W. Foster, of the Government Asylum for the Insane. Systematic treatment by this method is being instituted in the New York State Asylum for Epileptics at Sonyea, and the results are looked for with interest. Hinsdale believes that, as warm baths aid in the therapeutic administration of the iodids, they will also aid in the administration of the bromids. To some extent the treatment must of course be individual, and more benefit might be expected in cases of so-called idiopathic epilepsy, alcoholic epilepsy and in cases arising from intestinal intoxication than in focal or traumatic epilepsy. The difficulties in private practice also would be greater than in institutions, as long-continued, systematic treatment and unbounded patience will be required. Its value will be as an auxiliary method, modifying the dosage and aiding the action of the bromids. It will also be an excellent hygienic measure, favoring the action of the skin and improving the general tone of the system.

TRAUMATIC DEGENERATION AND REGENERATION OF THE SPINAL CORD.

That partial regeneration of the spinal cord seems to occur appears to have been established in Stewart's case, in which he sutured the cord after it had been completely severed by a bullet, and in the case recently reported by Dr. George R. Fowler before the American Medical Association. A timely experimental investigation of this subject has been made by A. Fickler (*Deut. Zeitsch. f. Nervenheil.*, July 13, 1905), who experimented on the lower animals. He subjected these to various traumas, involving the spinal column and cord, and also studied the result of action of part of the latter. His conclusions are as follows: There is no doubt of the occurrence in man of a transient paralysis of the spinal cord from trauma, without any injury of the spinal column or gross changes in the cord.

The protection afforded by the muscles, spinal column, veins and fatty tissue, together with the dura, is considerable. The same clinical picture can be produced experimentally in animals. The concussion imparted to the cord is a swinging movement. The paralysis is not the result merely of the concussion, but is the result of the milder form of contusion of the cord; the resulting total paralysis and the rapid recovery from the same are to be explained on the basis of variations in the axis-cylinder, and not of molecular alterations. The lesion in the cord is circumscribed, and

more marked at the point of contrecoup than at the point of application of violence. If the place of contrecoup is at the foramen magnum then a lesion of the cord does not occur. Apart from the localities of coup and contrecoup the extent of contusion is also determined by the varying consistency of the cord itself. The motion imparted to the cord by a blow is transmitted chiefly in the direction of the blow through the cord, losing in intensity as it proceeds from the point of impact; small waves also start radially from this point. The amount of contusion is proportional to the degree of trauma, the distance from its point of application and the resistance offered by the various tissue elements. The least resistant tissue is the nervous tissue; the blood vessels are the most resistant. Only in the case of opening up of the central canal does a flow of lymph have any destructive rôle. Central hemorrhages occur only with a damage of the nervous tissue, and only when the central veins are in the direction of the line of injury. Thombosis has little to do with the genesis of traumatic lesions of the cord. The vascular changes appear to cause only late forms of spinal apoplexy. As the results of the study of the process of regeneration in the spinal cord the author notes the following: The regenerative phenomena following experimental lesions of the cord in animals are not as marked as those following compression of the cord in human beings. Section of the white substance between the anterior horns and the periphery is followed by regeneration of reserve fibers above and below the plant of section. A regeneration of ganglion cells in the cord has not yet been observed. Regeneration of nerve fibers occurs in many diverse diseases of the cord, whether the disease has already run its course or whether it is slowly developing, it occurs in traumatism, compressions, syringomyelia and in transverse and disseminate myelitis. It does not occur in the columnar degenerations and in multiple sclerosis. In order that regeneration may occur it is necessary that the ganglion cell should be intact. The first evidence of regeneration is seen one week after the section, and this process proceeds slowly. Only a comparatively small number of fibers are restored. The functional result is not a very considerable one. The best conditions for a restoration of function in the anterior part of the cord are afforded by compression, which leaves intact the central veins and the general configuration of the cord. A regeneration proceeding from the posterior roots in compression has not yet been found, and probably can not occur, since the cause of injury of the cord is a caries of the vertebrae, which causes tuberculous ulceration of the ganglia on the posterior roots; in which case no regeneration can occur.

JELLIFFE.

FUNCTIONAL PSYCHOSES. E. Mendel (Deut. Med. Woch., xxxi., No. 44).

The author emphasizes the importance of medical watchfulness for the children of nervous parents, and of careful regulation of the manner of living, especially if the children show any nervous tendency. It is often wise, especially as puberty approaches, to take such children away from a home where the atmosphere is not favorable for combating the tendency and place them in the country or in a small town, where the life will be simpler. Their diet should consist largely of eggs, milk and fruit. In case of sleeplessness drugs should be a last resort after massage and hydrotherapeutic measures have been thoroughly tried. A patient who refuses food may sometimes be tempted to eat when unobserved if a glass of milk or crackers and bouillon are left on a table near his bed. Patients who soil themselves should be taken to the closet frequently, and the amount of fluid ingested restricted. For melancholia he depends chiefly upon opium, gradually increasing the doses and then decreasing. His maximum dose is 1 gm., supplemented by rest in bed and strengthening diet.

JELLIFFE.

News and Notes

AMERICAN NEUROLOGICAL ASSOCIATION.—The council announces that the thirty-second annual meeting will be held in Boston on Monday and Tuesday, June 4 and 5, 1906. There will be two sessions daily, from 10 A. M. to 1 P. M., and from 2.30 P. M. to 5 P. M. The Council calls to the attention of the members the fact that if they wish to contribute papers, article 7 of the constitution provides that the reader shall not exceed twenty minutes in the presentation of his paper, and shall not spend more than five minutes in its discussion. Members are expected to send titles and abstracts of papers to the secretary at least six weeks before the annual meeting; that is, such titles and abstracts should be received not later than April 19, and unless such titles and abstracts are received they cannot be printed in the programme. As the American Medical Association meets in Boston June 5 the Council advises the members of the American Neurological Association to be forehanded in securing hotel accommodations, and recommend the Vendome and Somerset Hotels. The annual dinner will be on Monday evening, June 4. All communications should be addressed to Dr. G. M. Hammond, 60 West 55th st., New York City.

The QUARTERLY JOURNAL OF INEBRIETY has been transferred to Mr. Richard G. Badger, of the Gorham Press Co., of Boston, Mass., who will henceforth have charge of the publishing and business part of the *Journal*. Dr. T. D. Crothers, who has been its editor for nearly thirty years, will continue to be in charge of the editorial pages. The demand for scientific literature in this field of medicine has increased to such an extent that a larger issue and *Journal* is called for.

The JOURNAL OF ABNORMAL PSYCHOLOGY will be published bi-monthly, beginning April 1, 1906. The editorial management will be under the direction of Morton Prince, M. D., Professor of Nervous Diseases, Tufts College Medical School; with the co-operation of Hugo Münsterberg, Ph.D., Professor of Psychology, Harvard University; Boris Sidis, M.A., Ph.D.; Charles L. Dana, M.D., Professor of Nervous Diseases, Cornell University Medical School, New York; James J. Putnam, M.D., Professor of Nervous Diseases, Harvard Medical School, Boston; August Hoch, Bloomingdale Asylum, New York; Adolf Meyer, M.D., Director Pathological Institute, New York State Hospitals. Dr. Edward W. Taylor, Instructor in Neurology, Harvard Medical School; Dr. George A. Waterman, Instructor in Neurology, Harvard Medical School; Dr. E. B. Holt and Dr. J. C. Bell, of the Psychological Department, Harvard University, and others, will aid in the department of current literature. The *Journal* is meant to subserve the interests of both medical science and psychology. It is primarily intended for the publication of articles embodying clinical and laboratory researches in abnormal mental phenomena. The field of investigation includes, for instance, such subjects as hysteria, hallucinations, delusions, amnesias, abouliias, aphasias, fixed ideas, obsessions, automatisms, alterations of personality, multiple personality, dissociation of consciousness, subconscious phenomena, relation of the mind to physiological processes, neurasthenic and psychasthenic states. The price of the *Journal* will be three dollars a year, postpaid, in the United States, Canada and Europe. Subscriptions and all business correspondence should be sent to The Old Corner Book Store, Inc., Publishers, 27-29 Bromfield street, Boston, Mass. Editorial communications should be addressed to Dr. Morton Prince, 458 Beacon street, Boston.

THE
Journal
OF
Nervous and Mental Disease

Original Articles

A CONTRIBUTION TO THE STUDY OF CEREBELLAR TUMORS
AND THEIR TREATMENT.*

BY J. J. PUTNAM, M.D.,

OF BOSTON, AND

G. A. WATERMAN, M.D.,

OF BOSTON.

The primary object of this communication is to record the results of a number of operations done for the relief of cerebellar-tumor symptoms, three of which were followed by a decidedly satisfactory result. In one of these cases a tumor was found and removed, with marked benefit to the patient. In the second case, no tumor was found at the first operation, but the symptoms, which had been so severe that the patient's life had been in imminent danger, completely disappeared with the removal of pressure and only began to return after the lapse of a year and a half. A second operation was then done, and the tumor was discovered and partially removed. In a third case, pressing symptoms were relieved by a palliative operation, and have, as yet, after more than five months, shown no tendency to return.

These three cases, as well as others which we shall briefly report, may serve also to throw some additional light on the subject of diagnosis, if only to strengthen the admirable generalizations drawn from the analysis of forty cases of cerebellar tumor reported by Stewart and Holmes,¹ and those given in the valuable symposium on the subject by Mills, Frazier, deSchweinitz, Weisenburg and Lodholz.²

*Read at the meeting of the American Neurological Association, Sept. 15, 16 and 17, 1904.

¹Brain. Winter, 1904.

²New York Medical Journal, 1905.

CASE I is that of a lady of forty years, who consulted one of the writers in April 1904, and gave the following history.

She had been in excellent health up to about one and a half years previously. At that time she began to have gastric discomfort, and to suffer from pains in the head of a neuralgic character, mainly across the eyes, which would come on especially when she lay on her back or on the left side. These pains increased gradually in severity and frequency, so that for the past year she had been unable to lie in any position except on the right side. Her condition in this respect was at its worst during the summer of 1903, since which period the pain had been more remittent, though often of a very distressing, throbbing character. "Choked disc" was found by an ophthalmologist in the spring of 1903, and the probability of brain tumor was recognized, but nothing was done in the way of treatment beyond the giving, for many months, of potassium iodide, in large doses. Fortunately, we have now advanced to the point where this time-honored measure is no longer considered good practice, unless, indeed, operation, either palliative or radical, has been proposed to the patient and rejected. Iodides are rarely of service except in the case of leutic disorders, of which there was here no suspicion, and their prolonged use wastes valuable time.

By September 1903, she had entirely lost the sight of the left eye and the sight of the right eye was failing.

At the period of the examination in April, 1904, she could count fingers at six inches, with the right eye. There had been some vomiting, perhaps a half dozen times in the course of the past year. The nausea had never been of a high degree, and like the headache was accentuated by lying on the left side. Dizziness was constantly present. The gait was so uncertain she did not take more than a few steps alone. When sitting she usually leaned forward and rested her head in her hands. The hands felt prickly at times and shook when she tried to use them. She had constant hallucinations of smell, and on this account both food and water were very disagreeable to her. The odor of which she complained recalled the scent of soap. If she saw a certain color, or even seemed to see it when her eyes were shut, she felt very uncomfortable. This distressing color was a sort of blue-green. On the other hand, colors ranging about the purple were not so unpleasant to her. The saliva was usually thick and gummy. The pupils were large in moderate light, the left larger than the right, but both reacted to changes of light. The eye motions were normal, except on looking to either the extreme right or the extreme left. Then the globes jerked slightly. The knee-jerks, wrist-jerks and ankle-jerks were all slightly increased and in the case of the two former the right was greater than the left. When the fingers were extended a fine tremor was seen. The nose-touching test showed a slight in-coordination affecting

both hands. The hearing was normal on both sides. There was no disturbance of cutaneous sensibility anywhere and no astereognosis.

At the second examination made a few days later, the knee-jerks and wrist-jerks were found equal but lively. The two hand-grasps were of equal strength. The abdominal reflexes were absent, the plantars slight but of normal character. On closer inquiry the following additional facts were brought out:

The unsteadiness of gait had showed itself but very little until three months previously, since when it had increased persistently. Although she called herself very weak, the strength of the grasp and of the leg movements was good, for a single effort. When sitting up she felt inclined to pitch forward and toward the right side, and on walking the head was inclined slightly toward the left shoulder. There was no apparent movement of objects during the attacks of dizziness, and the dizziness itself was not extreme. On making any considerable effort she was liable to turn cold and pale, and on one occasion, two months previously, she had fallen unconscious to the floor for a moment. Turning on to her left side made her head feel full and dizzy. When asked to rise from her chair, she did so very carefully and stood unsteadily, with an apparent inclination to fall backward, though at times either to the right or left. These difficulties were not increased by the closure of the eyes. The jerking of the eyes was greater when she looked toward the right. The blood pressure was 110. (Riva Rocci.)

The operation, by Dr. S. J. Mixter, was done in two parts, the first one being on April 24, 1904. In order to gain as much room as possible, a large piece of bone was removed from the occipital and parietal regions on the left side of the skull, leaving an opening which curved forward and upward, crossing the lateral sinus and reaching almost to the situation of the Rolandic fissure. There was some bulging below the tentorium, but the dura was not incised. The patient collapsed before the dressing was put on and was revived only with difficulty. During the next three weeks the patient was more comfortable than she had been before, though her gait was still very unsteady.

The second operation was done three weeks later. The dura was opened, exposing the left cerebellar lobe and bringing to view an apparently circumscribed tumor, the presenting portion of which occupied an area about the size of a nickel. This tumor was hard and resistant to the touch and could be shelled out with comparative ease, but it was found that most of the mass was imbedded in the brain tissue so that when removed it was found to be the size of a pigeon's egg. Microscopical examination showed the tumor to be a round celled sarcoma.

The operation was accompanied with only moderate hemorrhage, but before the wound was sutured the breathing grew

rapidly worse and suddenly ceased. Artificial respiration was resorted to, and this, with other restorative measures, brought about a fairly good condition in the course of twenty or thirty minutes.

For several days after the operation, the patient lay perfectly still on her right side with her head buried deeply in the pillow, not speaking and scarcely moving a hair's breadth though perfectly conscious and responding by the pressure of the hand to what was said. One could not but be reminded of the pigeons from whom the cerebellum has been removed. Attempts at motion caused pain in the neighborhood of the wound and dizziness.

As soon as it became possible to make any tests of vision, it was found that she was practically blind. This was obviously due to the shock and prostration of the operation, for her eyesight gradually began to return, and before she left the hospital was as good as it had been previously.

During the succeeding months the patient was able to sit up all the time and walk a little about the room. The headache and dizziness had completely disappeared although at times objects appeared to move in a wavy manner about her. She slept well and her general condition improved steadily, except that there was a decided weakness of the muscles of the left side, especially noticeable when she attempted to walk or to use her left arm.

The following letter, received nineteen months after the operation, shows that improvement is still going on and more rapidly than ever:

"In response to your favor of the 14th inst. would say that my wife is about most of the day. She lies down for a while each afternoon. As she feels a bit nervous about walking out alone she walks about the house and uses light Indian clubs for physical exercise and seems to be gaining in strength all the time. She walked out, the distance of about a block, alone this week, for the first time. She has been out driving a couple of times. All this out-door walking and driving has been during the last month. She has practically no headache. Her eyesight seems about the same as before the operation. She reads some and uses her eyes rather more than she did before the operation, as Dr. Putnam thought she could do so without injury. Her left side is weaker than her right, but this weakness is not so marked as it was. She is not conscious of any movement of objects about her, as formerly. On account of the still seeming weakness of the left side, she does not lie upon it, but she feels that she possibly might do so. In walking, she is still unsteady but can walk straight ahead. If there is any tendency to walk other than straight, it is toward the right, as she can see with her right eye.

"Her appetite is good and she sleeps well, better in fact, than at any time since she became ailing. Her general health seems

excellent and during the past month, her gain in strength and general health, has been more rapid than at any time since the operation."

In this case, aside from the general symptoms of brain tumor, (headache, vomiting and double optic neuritis), there were definite localizing symptoms which have been considered of value as an aid to diagnosis. The fact that optic neuritis was more marked on the left, may in general, be taken as indicative of the growth being on the same side, though this is not always the rule, and the sign is considered by Martin³ of far less value in cerebellar than in cerebral disease. He found, in his analysis of 601 cases of brain tumor, that the neuritis was more marked on the side of the lesion in 39 instances, while in 16 it was greater on the side opposite to the lesion. In the frontal, temporal, and parietal tumors the neuritis was accentuated on the same side in 26 cases, and on the opposite side in 5 cases. The cases of cerebellar tumors in his series with this unilateral accentuation of the neuritis were only 4, but in 3 of these the tumor was on the side of the more advanced neuritis. Cases have been reported by Bramwell,⁴ (Case 23) Clarke,⁵ (Case 2) and others, of cerebellar tumor in which the lesion and the more marked neuritis were on opposite sides.

The fact that vertigo was brought on by lying on the left side recalls the case of Osborne, cited by Mills, except that in that case the patient was unable to lie on the side opposite the tumor. The accentuation of dizziness and headache by the assumption of this position is hard to explain on theoretical grounds, since, in case where the tumor is deep-seated, the giddiness is probably due to involvement of the cerebello-vestibular tract, and the natural position of comfort would be on the unaffected side. The position of comfort, however, cannot be considered of diagnostic value with the present limited number of observations on this point. Stewart and Holmes, in the 22 cases which they fully report, mention this sign in reference to six cases. In 2, the patient lay on the side of the lesion, and in 2 on the side opposite the lesion, while in 2 cases in which tumor was located in the middle and extended into both lateral lobes, the patient had lain on the right side. It is probable that the gastric discom-

³Lancet, 1897, p. 81.

⁴Brain, Spring, 1899.

⁵Brain, Fall, 1898, p. 312.

fort of which the patient complained when lying on the left side, is akin to that sensation in the epigastric region commonly associated with giddiness and which is so similar to nausea.

The fact that the head was held inclined toward the left agrees with Batten's⁶ experiments, in which he found that removal of one cerebellar hemisphere was accompanied by the sinking of the occiput toward the shoulder of the affected side, while the chin was tilted upward and away from the lesion. This cannot be relied upon as an absolute sign, however, since, in cases of tumor, the head may incline to the side opposite the lesion, (probably from irritative rather than paralytic action of the growth), and, moreover, this sign may be present in frontal tumors, as in Case 5 of Bramwell's series,⁷ and in pontine tumors as in a case reported by Starr.⁸ Although Stewart speaks of this as a very unreliable sign, he reported the head carried to one side in 13 of his 22 cases, and in 8 of these 13 instances, the occiput was inclined towards the side of the lesion, in 2 toward the opposite side, and in the remaining 3 the tumor was found in the middle lobes, but extending into both lateral hemispheres.

The peculiar twisted attitude of the body described by Hudson⁹ in one of his cases was probably a phenomenon related to this head position.

The pronounced asthenia shown by the patient, immediately following the operation, has been observed in similar operations in this region and was probably a general symptom distinct from the muscular weakness on the left side which persisted so long. The latter is consistent with the theory of the involvement of Deiters' nucleus, causing hemi-paresis of the same side, though the eye muscles in this case were apparently unaffected.

CASE II is that of a boy of ten, of good family history. Some of his symptoms suggested tuberculosis, but no near relative had suffered from that disease. He had been an intelligent boy but rather puny in physical development. When four years old he had double pneumonia, and when nine years old pharyngeal adenoids were removed. The symptoms of the present illness declared themselves definitely in October, 1903, when he began to have headache, dizziness, and vomiting, the pain being chiefly frontal and occipital.

⁶Brain, Spring, 1903.

⁷American Journal of the Medical Sciences, April, 1893.

⁸Idem, September, 1903.

These tendencies increased through the winter of 1903-4, and towards the spring his eyesight began to fail and paralysis of the abducens oculi came on, showing itself first on one side, finally on both. The headaches were intense at times, causing the family many nights of anxiety and requiring repeated doses of morphine. On one occasion, when this did not allay the pain, inhalation of ether was resorted to. The vomiting and nausea had been so severe as materially to interfere with the taking of food, and consequently there had been much loss of flesh. The temperature ranged from 99° to 102°F.

In March, 1904, one of the writers was asked to see the patient in consultation and found the following condition:

The patient was much emaciated and unable to walk or stand on account of weakness. He was mentally dull in comprehending and slow to answer questions. The vision was markedly impaired, so that he had difficulty in recognizing persons in the room. The child had been naturally a gentle and affectionate boy, but the nurse said that he had recently become irritable and that he used strong and abusive language toward his parents. She also said that for several weeks past there had been hallucinations of sight and hearing, and that these had been increasing, so that then, when he was nearly blind, he declared that he saw his father at times and talked with him. At other times he would attempt to get out of bed and say he heard voices in the room telling him to do certain things.

There was marked internal strabismus of both eyes and neither could be rolled outward. Ophthalmoscopic examination showed optic neuritis on both sides, with a high degree of swelling. The hearing for the watch was good on both sides. The movements of the face were normal. The movements of the arms and legs were slightly incoordinate, especially on the left side. The knee-jerks were absent. The plantar, abdominal, and cremaster reflexes were normal on both sides. Kernig's sign was well marked. The sensibility of the skin was everywhere normal.

The diagnosis of cerebellar tumor having been made, and operation suggested, Dr. S. J. Mixter was called to see the patient, but thought his condition such that operation was not justifiable, since nothing else than a speedy termination of the case by death seemed in prospect.

As time went on, however, his condition did not very materially change, although the feebleness and emaciation were greater; and after two months had gone by another consultation was called and Dr. Mixter agreed to the plan of making a large opening over the cerebellum with the idea of proceeding further subsequently if this seemed warrantable.

The patient had become, by this time, wholly blind in the left eye and nearly so in the right, but the hearing was still good on both sides.

On April 29th, 1904, almost the entire occipital portion of the skull was removed, as rapidly as practicable. There was considerable bulging but the dura was not incised. The conditions were somewhat better after this, and as soon as the immediate effects of the first operation had passed away, a second was undertaken; at which the dura was freely opened on both sides. No tumor presenting itself, the bulging cerebellum was incised and explored freely with the finger, but without discovery of a tumor. The shock was by this time considerable, and the patient ceased breathing altogether, being kept alive only by artificial respiration. Even after the automatic breathing returned it was thought that he would surely succumb later, but to our surprise he did well and soon began to gain.



Fig. 1.

The cerebellum continued to bulge somewhat more but he improved steadily in all his symptoms, so that, five months later, the following letter was received from his physician, Dr. Chase, and a personal examination fully confirmed his statements.

"Nov. 20, 1904.

"G. has returned from a month's visit with an aunt, and I examined him yesterday.

"His general condition, in all respects, is excellent; he is even athletic; runs like a deer, and plays hard with other boys, except that I allow no football or wrestling. His knee-jerks are still wholly absent; his left external rectus is still weak, and his left pupil is a little smaller than the right; he reads also with difficulty with the left eye, but very readily with the right.

"The tumor in the occipital region appears to me to be slowly

growing, and is now, roughly speaking, the size of a third of a medium-sized coconut cut lengthwise. It is soft, but not quite as soft as if filled with fluid. It is free from tenderness, and he seems to take no notice of it at any time, lying on it when he wants to. There is no headache, no vertigo, no nausea. It is most fortunate that there is opportunity for bulging, also that the increase in bulk is so slow as to make it seem possible that the growth may cease, which I believe sometimes has occurred in somewhat similar cases."

The patient was next seen ten months later, when the following notes were made:

Friday, Sept. 15, 1905.

The patient has grown considerably during the past year,



Fig. 2.

even for one of his age. He remained as strong and as well as ever, until the middle of June, since which time he has been having one or more vomiting spells, two or three times a week, without reference to meals, and accompanied by frontal headache which comes and disappears with the vomiting. At times there is nausea without vomiting.

There is still some internal strabismus of both eyes, very slight of the right and somewhat more of the left. The right pupil is larger than the left, but both react well to the light. He can look fairly well to the extreme right or left, though these efforts are accompanied by a constant jerking of both globes.

There is no evidence of disturbance of the fifth, seventh, eighth, ninth, tenth or twelfth nerves. There is no marked ataxia of either hand. The wrist-jerks are equal and the grasp is strong

and equal in both hands. The sensation of the hands is normal. The knee-jerks are brought out only with reinforcement. The ankle-jerks are slight but equal.

The patient stands quite steadily with his feet together, with the eyes closed or open. He tends to deviate toward the right when his eyes are closed, in walking fifteen or twenty feet. He also staggers to the right every little while and says he has fallen several times lately.

On the back of the occipital region is a large protuberance, appearing like a meningocele (see fig. 2) soft to the touch, with visible pulsations, imparted to the superimposed hand, and measuring, (Sept. 15) 8 by $4\frac{1}{4}$ inches (an increase of about an inch for each diameter in the past year). There is no asynergy of movement and no Kernig's sign.

His vision was O. D. 5-6, O. S. 3-6. Ophthalmoscopic examination shows the disc of the left eye to be very pale and sharply defined, with small vessels, while the right fundus presents the same picture, though to a less marked degree. (atrophy)

The accompanying photograph of this patient clearly shows the degree of the occipital hernia, and recalls the condition of the patient described by Frye, where enlargement of the hernia began in from ten to twelve months after operation.

The striking feature of the case is, of course, the remarkable improvement resulting from an operation which seemed almost hopeless, and which was done when the patient's vitality was at such a low ebb.

The alarming failure of respiration at the close of the operation, in cases one and two, brings to mind the experience of Hudson in his two operations for cerebellar tumors. It is presumably due to the propinquity of the respiratory center to the field of operation.

A similar occurrence to this was recently observed in an operation on an abscess of the cerebellum at which the writers were present. Scarcely had the patient begun to inhale the ether, when respiration suddenly ceased and life had to be maintained by artificial respiration, while an opening previously made in the occipital bone was enlarged, the dura incised and a trocha inserted, a procedure requiring 6 to 8 minutes. At once on the evacuation of 2 to 3 ounces of pus, natural respiration became established and the patient made a speedy recovery.

The psychical symptoms which developed so comparatively early seemed to be of a different sort from those which often show themselves toward the close of life in brain tumor cases, resembling more nearly those seen with neoplasm in the frontal

region. They gain in interest when considered in connection with the experiments performed on the cerebellum of the dogs by Pagano.⁹ This observer found that injections of curare into the anterior part of the vermis gave rise to emotional excitement, with tendency to terror. These signs he considered as effects of irritation, since he had had reason to believe that destructive lesions of this portion caused lethargy and stupor. He therefore concluded that the cerebellum has emotional functions. Other observations corroborate, in general, this view. If this be the case, the difficulty of distinguishing between the cerebellar and frontal-lobe tumors becomes still greater.

Shortly after the notes above given had been written, that is in December of the present year, 1905, this patient began again to suffer from a gradual recrudescence of the old symptoms. His mind showed a tendency to dullness, which although not of high degree, yet stood in marked contrast with the functional activity of the preceding year. The eyesight, too, began to fail somewhat and the gait and movements of the hands to become unsteady. In walking he inclined toward the left, and it was the left hand that showed the greatest incoordination. Both discs were pale, without swelling, and with edges for the most part sharply defined. The appearance of atrophy was, however, much more marked for the left eye than for the right. No return of inflammatory changes could be made out.

A second operation was therefore decided on and was performed by Dr. Mixter, on October 17th. When the head was shaved for this purpose, the tension to which the skin, covering the large prominence over the occipital region, had been subjected was much more strikingly manifest. The scar of the old curved incision, which ran in general parallel with the outline of the occipital bone, and also the scar of a second incision which ran downward from this toward the base of the head, appeared as pinkish bands nearly a half inch in width, while the areas of skin which they bounded were thrust outward, as if they enclosed large tangerine oranges, laid side by side.

The incision at the new operation was made parallel with the old curved incision, in such a way that when dissected downward it disclosed a sac beneath, through a good part of its length. When this sac was opened, a nearly clear fluid gushed forth in a large stream, which rose several inches into the air. The sac proved to be a cyst with translucent lining, presumably formed by portions of a sarcomatous new growth, the body of which was found to lie beneath. Besides the primary cyst which was first

⁹Archives Italiennes de Biologie, 1905.

opened, other smaller ones were subsequently found. When the fluid had thus been evacuated, the entire protuberance was found to have disappeared and then it was easy to feel with the finger the hard mass of the new growth, lying at the bottom of the sac and passing by a gradual transition into the unaffected portion of the cerebellum. Several pieces of this growth were removed, but it was impossible to take it all, partly on account of the lack of a definable border, partly because the pressure of the finger or instruments brought about a cessation of breathing.

In spite of this latter effect, however, the operation was endured much better than either of the previous ones had been.

During the succeeding week, the patient has done quite well, except for the fact that deglutition and micturition were at first markedly interfered with. There seems to be no reason to believe that the tumor has, as yet, invaded vital parts, or closed the aqueduct of Sylvius, so that there seems to be no reason, now that pressure has been removed, why the patient should not enter upon another long period of relative immunity from material discomfort.

CASE III. The following history is that of a patient seen repeatedly in consultation at the Massachusetts General Hospital, in the winter of 1903. E. B. sixty-two years old. Single. American. Occupation, wood-chopper. Mother and one sister died of phthisis. The patient had himself enjoyed good health since childhood and had been a man of good habits. Denied venereal.

When first seen he gave a history of having been growing deaf in the right ear for about two years. For the past ten months he had been subject to dizzy spells, coming on suddenly and lasting for ten or fifteen minutes, and these spells had been recurring with increasing frequency, so that at the time of the examination he was unable to get about without a constant sense of giddiness. During the past month walking had been difficult on account of numbness and weakness of the right leg, and this condition was also present in the right arm. There had been increasing headache for several months, but no nausea or vomiting.

Physical examination showed a well developed and well nourished man, mentally sluggish, with slow but distinct speech. His color was good. The pupils were equal and retracted normally to light with accommodation. There was paralysis of the external rectus on the right side, otherwise the movements of the eyes were normal. The tongue was slightly coated but otherwise of normal appearance and was protruded in the median line. There was paralysis of the lower part of the right side of the face and diminished sensibility to touch and pricking of the entire right side of the face including the ear. Hearing was practically lost for the right ear, to bone as well as to air conduction, but the

drum of the ear was apparently normal in appearance. The hearing of the left ear was unaffected.

There was no evidence of disease of the heart, lungs, or abdominal organs. The epigastric, abdominal, and cremasteric reflexes were more lively on the left side than on the right. The knee-jerks were more lively on the right than on the left. Babin-ski's phenomenon was not present on either side. All movements of the right arm were weaker than those of the left, and the sensibility to touch and prick as well as to temperature were much diminished on the right trunk and right extremities. The

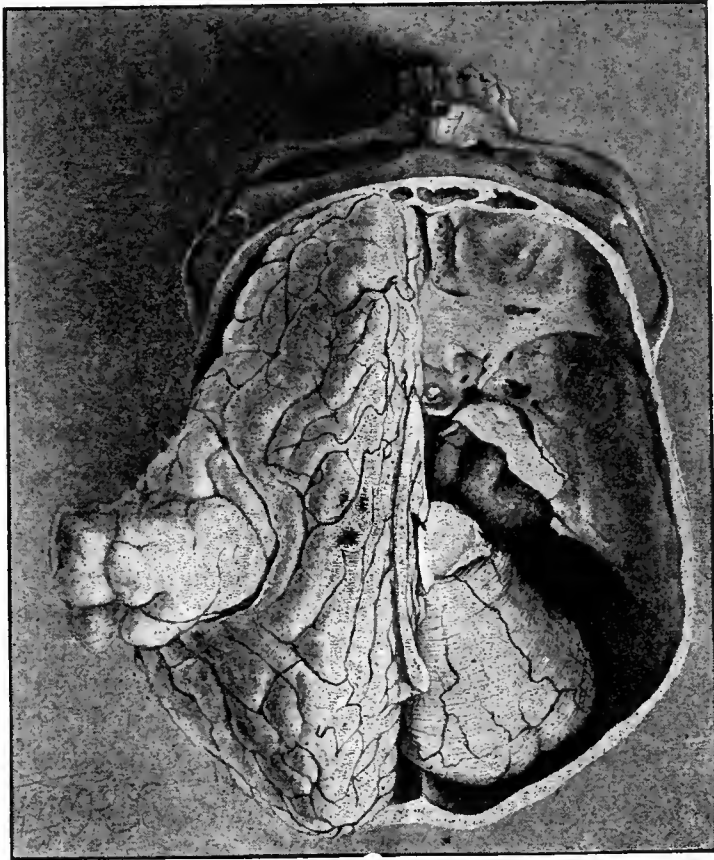


Fig. 3.

sense of position of the fingers and toes was also diminished on the right side. There was moderate ataxia of the right hand, and complete astereognosis, the patient not being able to distinguish a jack-knife from a fifty-cent piece. Ophthalmoscopic examination revealed a double optic neuritis with much swelling and hemorrhage.

The diagnosis of tumor of the brain was of course apparent, but there was a difference of opinion as to its localization, one consultant believing it to be in the left Rolandic region while the writers considered it to be in the right cerebellopontile angle. The patient was treated medically for four or five weeks, during

which time he grew more somnolent, and would lie in bed day after day, sleeping most of the time, and absolutely uninterested in his surroundings. There were involuntary evacuations of the bladder and rectum. When roused and questioned he would admit that he had headache, but otherwise made no complaint or outcry. The temperature followed the normal course, pulse ranging from 70° to 80°. The blood examination showed Hgb. 80% and white corpuscles 8000. Urine examination was negative.

After five weeks of iodide treatment, it was decided to operate, and the patient was transferred to the service of Dr. M. H. Richardson. A large piece of bone was removed from the left Rolandic region by Dr. Richardson. There was considerable bulging and the dura was incised, but no tumor was found. Following this operation there was complete right hemiplegia with aphasia, otherwise there was no change in the patient's condition, and three weeks later a second operation was performed. The old wound was opened to the bone and the brain explored to the depth of an inch but without the discovery of any sign of tumor. The patient gradually failed, and died about five weeks after the second operation.

The autopsy by Dr. Oscar Richardson, showed considerable brain-hernia with purulent infiltration. There was purulent meningitis of the convexities (*streptococcus*). The middle-ears and the blood-vessels of the brain were normal in appearance. Under the tentorium, in the posterior fossa a tumor was found, about 3 ½ cm. long by 3 cm. deep and 3 ¼ cm. wide, (see figure), resting along the inner part of the petrous bone, extending anteriorly to the clinoid process of the sella turcica. It impinged on the upper right side of the pons and on the right crus, making a well-marked depression. In some places the tumor was separated from the bone by dura, from which it seemed to originate. The section of the tumor showed it to be dull gray-red in color, and of firm consistency. It proved to be an endothelioma.

The existence of the hemiplegia on the same side as the involvement of the 6th and 8th nerves, formed, of course, the grounds of disagreement in the localization of this case. This is probably brought about by forcing of the pyramidal tracts downward and laterally against the bone on the side opposite the tumor and giving rise to greater impairment to its conductivity than is brought about by pressure of the tumor itself.

Tumors of the nature and location of the one described in this case are, with our present surgical skill and technique, to be considered operable; and in view of the number of neurofibromata that have been found in this region, should offer hope of absolute cure.

CASE IV, was first seen privately by one of the writers and sent to the Massachusetts General Hospital, where he came under the care of Dr. J. C. Warren. This patient was a man fifty-five years old. He was born in Finland, and had been for many years a day laborer in this country.

At the examination on the first of January, 1904, he gave a history of having had constant headaches for ten weeks. These had become progressively worse and were much more severe at night than by day, so that he would stagger about the house complaining so bitterly of the pain in the frontal region, and talking so wildly, that his wife feared he would kill himself. He had been growing dull mentally, and his walk had been growing more and more unsteady, with a tendency to stagger toward the left. On two occasions a prickly sensation had come on in the



Fig. 4

left hand and arm, extending up to the left cheek and the inside of the mouth. During these attacks, which lasted about half an hour, he could use his left hand and arm only with difficulty. He had been at that time under a thorough iodide treatment for several weeks, taking four hundred and fifty grains a day without relief from symptoms.

Examination showed a well developed and well nourished man, slow to comprehend and to answer questions. The pupils were equal and reacted normally. There was a marked optic neuritis of both eyes with considerable swelling of both discs and hemorrhages. No other cranial nerves were involved except the right auditory. There was complete loss of hearing on the right to air and to bone conduction, while the drum was of normal appearance. (The patient said he had been deaf in the right ear for

two years.) The wrist-jerks were slight and equal. The grasp was equally strong with both hands. The knee-jerks were slight and equal. There was no impairment of the sensation of the arms and legs, and no astereognosis. The head was not held in any unnatural position. The gait was staggering, and this tendency was especially noticeable in turning, but on repeated tests it could not be made out that there was more tendency to incline toward the left than toward the right.

It was a question at this time whether the more probable site of the new growth was the cerebellum or the right parietal region. The two attacks of temporary paresthesia and weak-



Fig. 5.

ness of the left arm, however, seemed to be the most definite localizing signs, and consequently the skull was opened just posterior to the left Rolandic region, and a large osteoplastic flap turned back. The dura bulged abnormally, and when it was incised a large amount of serous fluid escaped. No tumor was found, and the flap was replaced.

During the succeeding two months the headaches were much less, though the gait continued unsteady and the patient frequently fell in getting about the house. At the end of this time examination showed a marked astereognosis of the left hand, (inability to distinguish a half dollar from a knife or key), and though the sense of touch and pain were unimpaired, the spacing-sense of the right hand and foot were found to be much diminished. It was thought that this was probably a result of operation. The grasp of the right hand was still as strong as that of the left. The knee-jerks were obtained only with difficulty and by the aid of reinforcement. The swelling of the optic discs had sub-

sided, though the bone removed at the operation had healed in solidly.

After the two months' respite the headaches and vomiting began to return and became so severe that a second operation was decided upon. This time the dura was exposed over both hemispheres of the cerebellum, but there was no marked bulging and the investigation was carried no further. The patient again obtained relief from his headaches, but failed very slowly and died eight months later.

The autopsy, performed by Dr. E. E. Southard, revealed the presence of a glioma of the right cerebello-pontile region. The report described its limitations as follows: "The anterior portion of the left posterior cranial fossa is occupied by a mass, somewhat readily separable from the dura of the temporal bone, which has encroached by pressure upon the pons, effecting a smooth cavity about one c. m. in its middle portion. The mass passed indistinguishably over into the tissue of the right cerebellar hemisphere, sparing the dentate nucleus. The fifth nerve passes over the substance of the mass in a thin strap. The mass is readily separable from all surrounding structures except the cerebellum. The outer and posterior portion of the mass is made up of a dark green tense-walled cyst, containing a clear amber-colored fluid. The substance of the growth is firm, in places of a whorled appearance, and varies in color from a slightly translucent gray to an opaque reddish yellow. There are numerous hemorrhagic areas throughout."

It is interesting to compare these photographs with those of case 20 in Stewart's series which has since come out. Oddly enough, the sections through the tumor were made in the same (oblique) plane in both cases, and the pictures seem identical as regards the appearance, size and location of the tumors, though the symptoms of the patients were in some respects so different.

Why the headache and vomiting should have been so prominent a symptom with one patient, and the knee-jerks practically absent, while the other patient had headache and vomiting only on one occasion and presented exaggerated and unequal patella-reflexes, it is difficult to explain, especially since the course of development of each of the tumors extended over two to three years.

Considering our case retrospectively, it is evident that complete removal of the tumor could not have been effected, but the patient could, undoubtedly, have obtained longer relief from the first operation if the bone had not been replaced, and this, of

course, should be the procedure in all cases where relief from pressure is to be the object of the operation.

CASE V. This is the case of a young girl of fifteen, a patient of Dr. Sheehan, of Salem, with whom she was seen in consultation.

The first examination was made in April, 1905, when the following history was obtained:—

For nearly twelve months she had been subject to occasional attacks of vomiting and for the past month or so to “weak spells.” A tendency to stagger in walking had also gradually shown itself, and there had been more or less pain in the head, not exactly localized and not excessively severe. As a rule, this pain had either been frontal or occipital. Her eyes had recently been examined by a competent oculist and optic neuritis found. There had been none of the “weak spells” during the month previous to the examination but three times she had fallen to the ground without loss of consciousness. Rising from a chair caused dizziness and it seems to have been a feeling of this sort which caused her to fall. At times there had been slight double vision though not of late. There was no paresthesia.

The physical examination showed an intelligent looking girl, rather pale, but with the appearance which suggested natural good health and good development. The pupils were large. They responded, however, well to light but not with convergence. The facial expression and movements were normal and the eye movements normal. The movements of the arm were slightly ataxic whether the eyes were closed or open.

The vision of the right eye was nearly normal so that ordinary print could be easily read, but with the left eye she could only with difficulty recognize people whom she knew. Ophthalmoscopic examination showed a well marked neuritis; the arteries were almost covered by exudation and swelling; veins very large and dark in color; the outlines of the disc could not be made out. The hearing was normal except in the right ear, which was the seat of an old inflammatory middle ear disease.

After consultation with Dr. F. G. Balch, the patient was advised to place herself under his care, at the Faulkner Hospital, for operation. This was performed on May 9th, 1905, and completed on May 19th.

At the first operation, nothing more was done than to expose the left lobe of the cerebellum by a very large opening, which ran up above the lateral sinus, without incision of the dura.

At the second operation, the dura was incised, upon which the cerebellum thrust itself outward, as if under great pressure. A very large quantity of serous fluid gushed out, the greater part of it coming from the space between the cerebellum and the ten-

torium, having presumably made its way to this opening from the ventricles within. No tumor could be seen or felt, even by extensive search, and the wound was therefore closed.

Ever since this operation the condition of the patient has been satisfactory in all essential respects.

The report of an examination made on October 11th, that is seven months after the operation, shows that there has been no headache or vomiting, but the patient has gained fifteen pounds in flesh, can lie comfortably on either side and feels, in general, bright and well.

There is a hernia, the size of an egg, over the left occipital region, and at the most prominent part of this there are still points on the line of suture which, until recently, had not fully healed. From this point a vast amount of oozing has taken place at times, amounting in all to many quarts. For the past two months, however, this oozing has not occurred.

The vision for the right eye was 20-20ths, but with the left eye she could not count the fingers at the distance of a foot, though she could recognize the motion of the hand. The movements of the eye were normal. The left hand was somewhat ataxic in its motions and slightly weaker than the right. The knee-jerks were brisk and equal. It is said that the left leg had been feeble and its motions imperfect for some weeks after the operation, but now the gait is normal. No sign of optic neuritis was present but the left disc is pale and shows traces of the former pathological condition.

CASE VI is given briefly on account of the similarity of the symptoms to those of tumor of the cerebellum.

She was a healthy school-girl of sixteen, with a good family history. At the time she was first seen by the writers she had been having paroxysms of severe occipital headache for three months. There had also been vomiting without nausea and without relation to meals or to her headaches. From time to time, she would be overcome with a sense of dizziness, associated with apparent movement of objects backwards and forwards, or laterally, and at such times she would stagger in attempting to walk, running into people or objects to the right or to the left. This symptom was of a few weeks' duration. For some weeks past her friends had noticed an increasing prominence of her eyeballs, and she had been conscious of dimness of vision. She also said that she had recently been growing unusually irritable.

She was a well-developed, healthy appearing girl of good color and quick and clear intellect.

The exophthalmos was so marked as to attract notice at the first glance. It was equally pronounced on the two sides, and was associated with a slight bilateral internal squint. The pupils were rather dilated and reacted normally to light. There was considerable weakness of both external recti and weakness of

the internal rectus on the right. She could close the eyelids, but only feebly, and the right less strongly than the left. The strength of the muscles of expression of the lower face was also diminished, especially on the right. The vision was markedly bad, the patient being able to count fingers only with difficulty at a distance of two feet, with either eye. Hearing was diminished to bone and ear conduction, and equally good on both sides. There was no sign of disease of the fifth or twelfth nerve, no affection of swallowing, and no unnatural position of the head or rigidity of the neck. The grasp of both hands was equally weak. The sensation in the arms and legs was normal. There was marked ataxia of the right hand and to a less degree of the left. The gait was unsteady, but she showed no marked tendency to deviate to one side more than to the other. The knee-jerks were absent; the plantar reflexes slight. No astereognosis was detected. Ophthalmoscopic examination showed a marked choked-disc of both eyes, with swelling and hemorrhages extending out into the retina.

The patient was referred to the service of Dr. H. H. A. Beach, and was operated on by him. A large opening in the skull was made over each cerebellar hemisphere extending above the lateral sinus and these openings were connected below the torcular, giving a butterfly-shaped exposure of the dura. The dura was very tense, but not more so on one side than on the other, nor could any sign of a local tumor be detected through the membranes, either visually or by palpation.

Although the condition of the patient was still good at this stage, it was considered advisable to postpone the opening of the dura to a second operation. The patient came out of the ether well, but several hours later, her respiration and pulse failed rapidly and she became unconscious and died.

The autopsy showed a marked degree of intra-cranial pressure. The convolutions of the brain were much flattened and the pons and the cerebellum much indented by the bony outlines of the base of the skull. The third ventricle was so distended that its inferior wall was pushed sharply out behind the chiasm, suggesting the presence of a large cyst. One could easily see how a distension such as this might be the cause of a pressure-neuritis in the optic nerves. The lateral and fourth ventricles were similarly distended with fluid, thus completing the picture of a typical internal hydrocephalus. On section of the brain the cause of this condition was found to be the pressure of a grayish-white, gelatinous-looking mass, springing from the floor of the fourth ventricle and closing the aqueduct of Sylvius.

On microscopical examination this growth proved to be a sarcoma.

In this case, the onset of the dizzy spells, associated with an apparent movement of objects, the rapid development of the

optic neuritis, and the disappearing of the knee-jerks, were, of course suggestive of tumor of the cerebellum, though there was no sign of a localizing value. Symptoms such as these have been noted in case of tumor of the 4th ventricle reported by other observers. Thus, Becker¹⁰ has placed on record a case of the sort in which he found a uni-lateral optic atrophy. In view of the early and rapid development of the optic neuritis in similar cases, it seems probable that this atrophy may have been preceded by an optic neuritis.

CASE VII. The following case is of interest on account of the absence of characteristic symptoms of cerebellar tumor, due, no doubt, to the fact that the growth was slow, and affected one lateral lobe alone.

The patient began first to suffer from a sense of pressure and sharp pains in the head, principally in the forehead and vertex. These were especially severe in the morning and two or three hours after meals. At these latter times, the pain was usually associated with gastric flatulence and nausea. In other respects he felt well and he was able to attend to his business until toward the end of his life.

Dizziness was present only on stooping. There was numbness of the whole right side of the face and right half of the tongue and in the teeth, but no disturbance of sensibility or taste could be detected.

From the first, double optic neuritis was found to be present, though not of a high degree and not interfering with sight. The pupils were equal and responded well to light.

The tongue was not protruded quite so far as it should have been and pointed with rather a sharp curve toward the right, possibly because of a deep-seated cicatrix. The movements of the globes were perfect. The speech was very slightly thick.

He had noticed nothing wrong with his hands, except that once or twice, while shaving his face a sort of shaking movement had occurred.

No disorder of the gait had been noticed and no impairment of hearing was complained of by the patient.

The patient's condition remained for about two years unchanged, but the headache gradually became more severe and mental dullness showed itself.

Finally, twitching movements of the right hand showed themselves and it was at first suspected that these had a localizing value. At this period (1890) cranial operations were not so frequently performed as they are now, but preparations were

¹⁰Archiv. f. Psychiatrie. Vol. 35, p. 492.

being made to carry out this treatment, when the patient suddenly failed and died.

At the post-mortem examination a small and soft glioma was found on the upper surface of the right lobe of the cerebellum. In view of this position of the tumor it does not seem possible that the cranial nerve-roots were primarily involved.

CASE VIII. This case also, which was observed many years ago, acquires fresh interest as indicating the difficulties that may attend the diagnosis of tumors occupying the cerebellar pontile angle, to which reference has been made. The majority of these tumors spring from the cerebellar nerve-roots and the first symptoms are usually disturbance of hearing or signs of injury of the fifth nerve.

In this case the primary symptoms were of the sort thus indicated, and their course was such as to harmonize very well with that observed in these external growths, whereas, in fact, the tumor was situated within the substance of the pons.

At the time of the first consultation, July 21, 1898, the patient was 29 years of age, an unmarried man, by occupation a farmer.

His chief symptoms at that time were as follows: deafness of the left ear, loss of taste on the left side of the tongue, impairment of sensibility of the left side of the face, including the left half of the forehead and nose.

These symptoms had come on gradually and were of a number of months' standing. He had had no pain in the face, but did complain of a sense of numbness there and also of diffuse headache which was worse in the morning and usually began with pain at the back of the neck, associated with nausea.

He had begun of late to have a slight degree of diplopia, with blurring of outlines, and some unsteadiness of gait. There had been no difficulty in the use of the hands.

From this time on the symptoms gradually increased in severity and slight mental irritability showed itself. There was more difficulty in turning the eyes to the left than to the right, and the effect gave rise to twitching movements of the globes. Swallowing next became affected. A few months later the deafness was so great that a watch could not be heard with the left ear, even on contact, though a voice was still heard fairly well. Tests for the taste sense with sugar and salt confirmed the fact that it was lost on the left side of the tongue. The temporal and masseter muscles contracted on both sides, but less strongly on the left. There was a slight swaying with closed eyes and this time the fundus was found to be normal on repeated examinations, but on January 20, 1899, it was noticed that an optic neuritis had begun to show itself on both sides, and this gradually increased. The knee-jerks also became more and more lively, the left more than the right and a slight facial paralysis appeared on the left side. Indeed, the movements of the facial muscles, as a

whole, were rather lacking in mobility. He also felt depressed and inclined to shun his friends and disliked to hear music, of which he had previously been very fond. He said he was troubled by horrible thoughts, but could not tell exactly what they were.

The further progress of the case was steadily, though slowly downward, with a gradual increase of all the symptoms, the only fact which is especially noteworthy being, that a lumbar puncture, which at that time had not been shown to be a dangerous proceeding in cases of cerebellar tumor, gave rise to a collapse which almost proved fatal. The respiration fairly ceased and the patient would have died had it not been for artificial breathing. In fact, he lived for more than a year longer and died with a gradual increase of all the symptoms. At the post-mortem examination, a large growth was found within the substance of the pons, causing great pressure on the surrounding tissues.

CASE IX.—This patient was seen in the neurological out-patient department of the Massachusetts General Hospital, in January 1906, and was sent to the medical ward in Dr. R. H. Fitz's service for observation.

She was a woman thirty-nine years old, born in England. Married. The family history and previous history were unimportant.

For one year she had suffered from tinnitus and increasing deafness in the left ear.

There had been considerable headache, vomiting, and unsteadiness in getting about, for several months, but these symptoms had been much more troublesome during the past few weeks, so that in going about the house she would pitch into things, generally lurching toward the left. The headaches were generally in the left frontal and left occipital regions and came in several short daily attacks. During the past 3 months there had been double vision. Attacks of unconsciousness had also begun to occur three weeks previously to our examination, but had increased in frequency so rapidly that she was having them ten or twelve times a day at the time of her entrance to the hospital. These attacks were always preceded by a sense of burning in the throat and a prickly feeling in the left arm, sometimes extending to the right arm. These sensory symptoms generally lasted two to four minutes before unconsciousness came on, and at times occurred independently of any attack.

One of the writers witnessed an attack of the sort above noted and made the following observations: The patient first complained for a minute or two of a burning in her throat and epigastrium, saying it felt as if she had swallowed red pepper. Then she began to rub her left forearm and hand saying they felt prickly and were very uncomfortable. Suddenly both her arms dropped and her eyes closed—and at once the arms and fingers became flexed in tonic spasm. The eye then assumed a

position of conjugate deviation toward the right, the pupils became dilated and the jaws set and the breathing became noisy, though regular (25 to the minute).

This condition lasted about a minute and a half when the muscles relaxed, the face flushed, and she soon regained consciousness.

In this attack, and in many others which we observed, there was a marked slowing of the pulse with a lowering of the tension and volume during the paroxysm, the pulse generally dropping from its normal rate of 75 to 45 or 50.

Physical examination of the patient showed her to be a fairly well developed but poorly nourished woman. The pupils were equal and reacted normally. There was a lack of expression of the left side of the face and the left eye could not be closed tightly. There was also a paresis of the external rectus of the left eye, giving rise to an internal strabismus which varied in degree from day to day.

Optic neuritis was present in both eyes, with marked swelling and hemorrhage. The vision of the left eye was almost *nil*, while she could read coarse print with the right. There was a slight degree of anesthesia of the left half of the face and complete loss of hearing in the left ear for both bone and air conduction. The tongue was protruded straight and in the median line.

The condition of the heart and lungs was normal. The knee-jerks were normal, plantar reflexes normal, sensation of extremities normal. There was no weakness or ataxia of the extremities of either side. A careful search for neurofibromata of peripheral nerves was fruitless. Speech was not affected and the intellect was clear.

The patient was also seen by Drs. G. L. Walton and W. E. Paul and all agreed on the diagnosis of a tumor of the left cerebello-pontile angle. Since the epileptiform attacks were occurring more and more frequently and the headaches increasing in duration and severity, and since the sight was failing rapidly, it was advised to operate without delay.

Accordingly on January 20, Dr. M. H. Richardson removed a large part of the bone of the left occiput, leaving an opening about two and a half inches in diameter, and extending almost to the foramen magnum. Since there was considerable unavoidable hemorrhage from the emissary veins it was thought best to postpone the completion of the operation to a later date. Accordingly one week later, the wound was reopened and the dura incised. On this occasion a considerable portion of the left lobe of the cerebellum was removed and space thus obtained for the admission of the finger. The tumor was easily felt and was removed without great difficulty and apparently entire. It seemed to be an encapsulated mass, about the size of an English walnut,

and lay, as had been supposed, on the ventral surface of the pons. Subsequent examination showed it to be a fibro-sarcoma. As the tumor was removed there was a sudden burst of blood which was controlled by packing. The patient made a good recovery from the operation and did well for three days. At the end of this time and apparently as a result of the removal of the packing, she began rapidly to fail and died on the fourth day after operation.

The post-mortem examination showed a considerable amount of fresh hemorrhage over the pons (see fig. 6).

This case presents several points of interest. The symptoms



Fig. 6.

in general were characteristic of the usual picture seen in neuro-fibromata found in this region. The aura of the epileptiform attacks were however unusual, and suggest a disturbance of the glossopharyngeal nerve, which might well have been caused by the lesion found, while the bradycardia during the paroxysms points to a similar involvement of the vagus.

It is also interesting to note that we have here another ex-

ample of the impunity with which the lateral lobes of the cerebellum may be attacked, for in spite of the amount removed (see fig. 6) there was no additional impairment, certainly no considerable impairment of the strength or coordination of the arms.

The case, though unfortunate in its termination, should inspire us with fresh courage for it seems certain that had it not been for the hemorrhage following the operation the outcome would have been a happy one.

While it is plain that the recent studies in localization of cerebellar new-growths have brought a series of data within our reach that the careful observer can often turn to practical account, it is equally clear that the evidence on which the diagnosis must be based is still very often so confused and contradictory that a satisfactory localization is impossible. Even for cases such as these, however, the writers wish to urge that operation may be justifiable and indicated. Such operations, it is true, offer no promise of cure, but since it is the nature of tumors, in this region, to produce an early hydrocephalus, with often such intense headaches and rapidly developing blindness, it is not only possible but imperative to offer the patient the chance of relief from these symptoms.

The great amelioration or disappearance of headaches, following relief from pressure after removal of a large piece of bone, is, of course, the rule in these cases; while the chance of saving or improving the eyesight by this measure is illustrated by Paton's¹¹ investigation. He found that out of 47 patients with brain tumor, who showed optic neuritis and were operated on, 17 died; while 30 lived for a considerable length of time. Of this number 22 retained useful vision, although some of them had become nearly blind before surgical aid was employed.

Of course, with fair certainty of accurate localization, there is always the hope that the tumor will prove of such a nature as can be removed with permanent cure. The number of cases which end thus happily, however, it is difficult to estimate, since the reports are given too early for the reader to learn the outcome. Nevertheless, the results are unquestionably better with our present improved methods than they were ten years ago, as is illustrated by comparing Starr's figures with those of later operations.

According to Starr's¹² report, drawn up in 1893, there had

¹¹Review of Neurology and Psychiatry, August, 1905.

¹²American Journal of the Medical Sciences, April, 1893.

been, up to that time, 13 operations on cerebellar tumors, in only one of which had the growth been successfully removed, while the operation-records showed a mortality of 77% ; whereas out of the 20 cases operated on by Horsley as reported in Stewart's series, only 11 or about 50%, had died within two weeks of the operation and 6 were living and improving, after periods of four to seven months after the operation.

It is to be hoped that the valuable papers of Hunt and Fraenkel¹³ may result in a more ready recognition of the neurofibromata of the cerebello-pontile angle, and that operations on these may give rise to more favorable statistics. On the other hand, as Finkelnburg¹⁴ has recently pointed out anew, the difficulty in diagnosis of cerebellar lesions is increased by the fact that chronic internal hydrocephalus may cause symptoms which have been considered characteristic of cerebellar disease.

¹³Medical Record, Dec. 26, 1903.

¹⁴Deutsche Zeischrift f. Nervenheilkunde, 1905, H. I., p. 135.

HYPESTHESIA AND HYPALGESIA AND THEIR SIGNIFICANCE IN FUNCTIONAL NERVOUS DISTURBANCES.¹

BY E. B. ANGELL, M.D.,

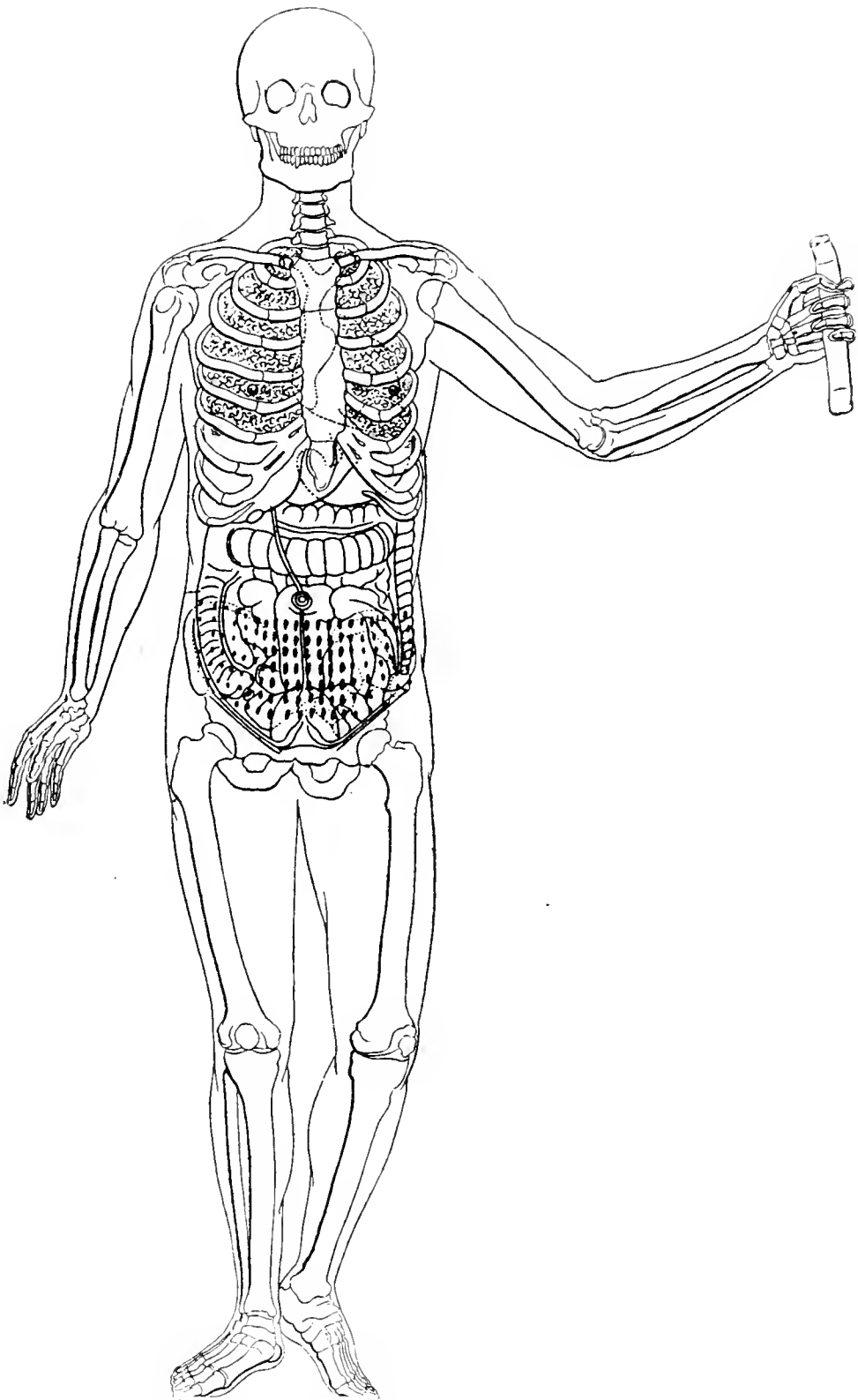
OF ROCHESTER, N. Y.

Some eight years ago a patient, a woman, under my care suffered much stress both of mind and body from sexual hyperesthesia. Associated with this special sensory exaltation was a peculiar phase of erotic ideation that at times almost amounted to a hallucination, and constantly gave rise to imperative ideas. A local examination disclosed a condition of sexual tumescence associated with the usual congestion, heat, turgescence and secretion. But curiously there was a marked blunting of ordinary sensibility all about the external genitals, both to touch and pain. Even a strong faradic current was only slightly appreciated. It occurred to me then that by re-establishing common sensibility it might be possible to relieve the sexual hyperesthesia—thus replacing a morbid feeling in the mind by a real one. The result proved my reasoning correct, for after each faradization the erotic excitability was relieved for a period of time. The interval of relief increased from day to day until in time the local conditions became normal, and common sensibility was restored. At the same time there was a concomitant improvement in the mental phenomena very gratifying alike to the patient and myself.

This experience fastened itself in my mind and was the starting point for clinical investigations upon the possible relationship between blunting of sensibility and the morbid states of mind so common among neurasthenics, hysterics and the insane. Hypoesthesia is the term heretofore employed to express this condition, but its awkward form at least excuses the employment of hypesthesia as a more euphonious and therefore more satisfactory expression.

That there is a close relationship between skin sensibility and normal consciousness of the individual is more and more being recognized by the psychologists. Ribot in his "Diseases of Per-

¹Read at the meeting of the American Neurological Association, June 1, 2 and 3, 1905.



Case 1. Area of hypesthesia and seat of morbid reeling.

sonality" suggests this when he says, "It is the organic sense, the sense of the body, usually vague and obscure but at many times very clear in all of us, that constitutes for each animal the basis of his psychic individuality." The neurologists, however occupied with neuropathology, have given too little attention to this relationship and its significance in perversion of mental activity, except when exhibited to a marked degree, as in hysteria. In this connection it is a matter of interest to note that both the skin and central nervous system are developed from a common source in the fertilized ovum, the epiblast; and this embryological association must have some significance in functional manifestation.

The classical investigations of Weber² are the first records we have of the measurement of skin sensibility, and are still quoted in the text books to-day. His results, however, were obtained by tests made upon himself by the esthesiometer, while no special attention was paid to conditions necessary to establish a standard for comparison. Valentine³ shortly afterward made similar investigations in esthesiometry, his results comparing very closely with those established by Weber, although the mean of several observations gave a uniformly shorter distance at which both points of the esthesiometer could be determined.

Furthermore, Weber's observations do not indicate accurate anatomical localization necessary for comparison and in other respects his technique is faulty.

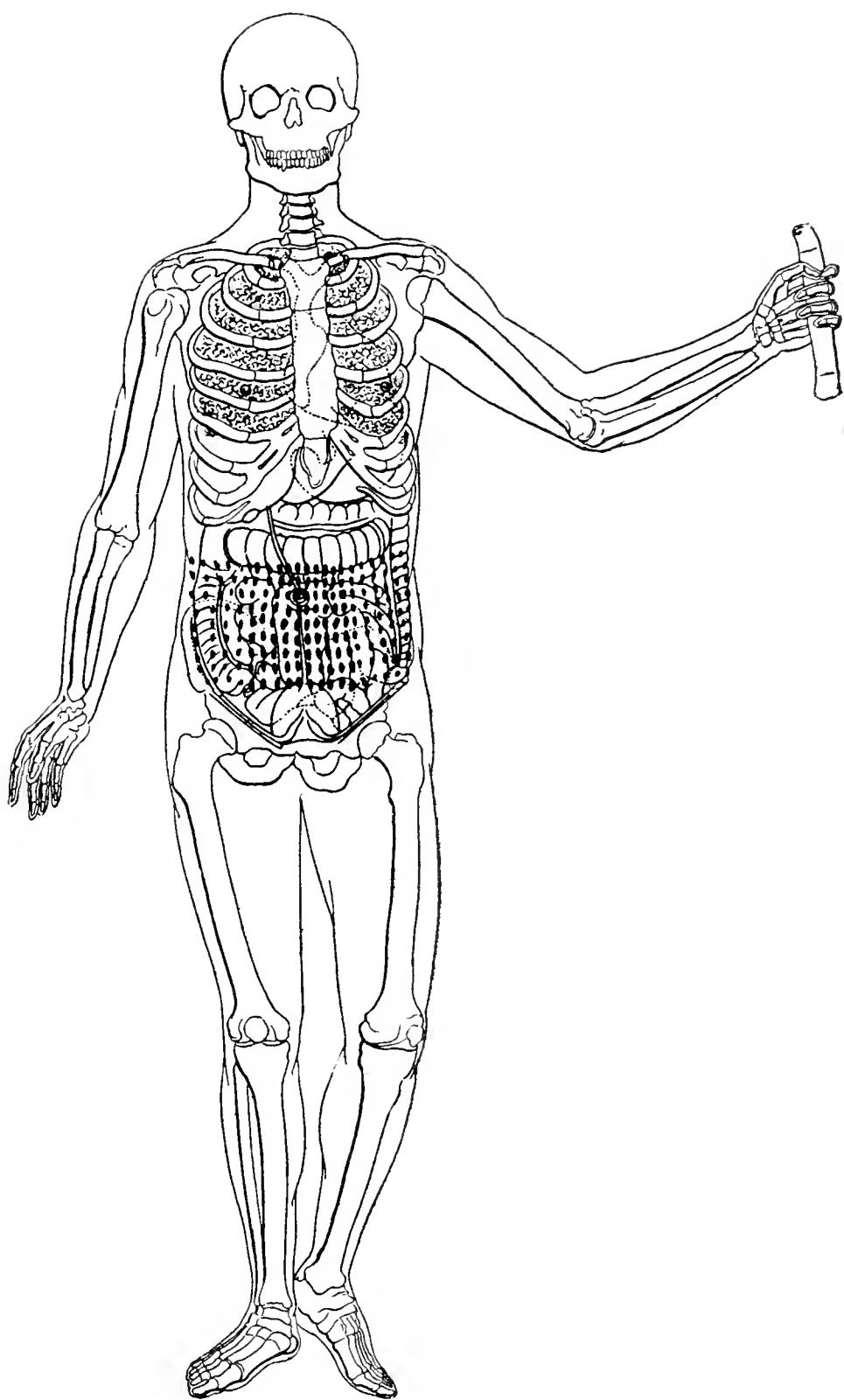
Recently this question of topography of skin sensibility has been carefully studied by Marillier and Philippe⁴, who observed great care in technique and in the selection of subjects for observation and comparison.

From these studies they developed the following conclusions:

1. If the legs of the esthesiometer are furnished with different forms for contact, e.g. a ball and a cylinder, the distance necessary for the subject to distinguish the two points of contact is lessened.

2. The regions of the body more subject to exercise perceive more readily.

3. Cutaneous sensibility varies more or less and is less obtuse in normal individuals than Weber found it: e.g. the authors indicate a normal sensibility of the abdomen of 30 m.m., of the



Case 2. Area of hypesthesia and seat of morbid feeling.

middle of the back of 40 m.m., about two-thirds the distance given in Weber's tables.

4. Frequent repetition of the tests show the presence of "left-over sensibility," which can be dispersed by time or by a stroke of the hand.

5. Exercise lessens the required distance. Indeed, from time to time the required distance varies, but always within certain limits. Hence they argue the possibility of sensorial education.

This investigation, while unquestionably more accurate than any that has preceded it, does not give the data acquired with sufficient regard to ordinary anatomical landmarks to be of much comparative value to the clinician. Other authorities also have studied this subject of normal esthesiometry, but they need no particular reference here.

In the investigation of disturbances of sensibility Richet, Janet and Head unquestionably have done the most.

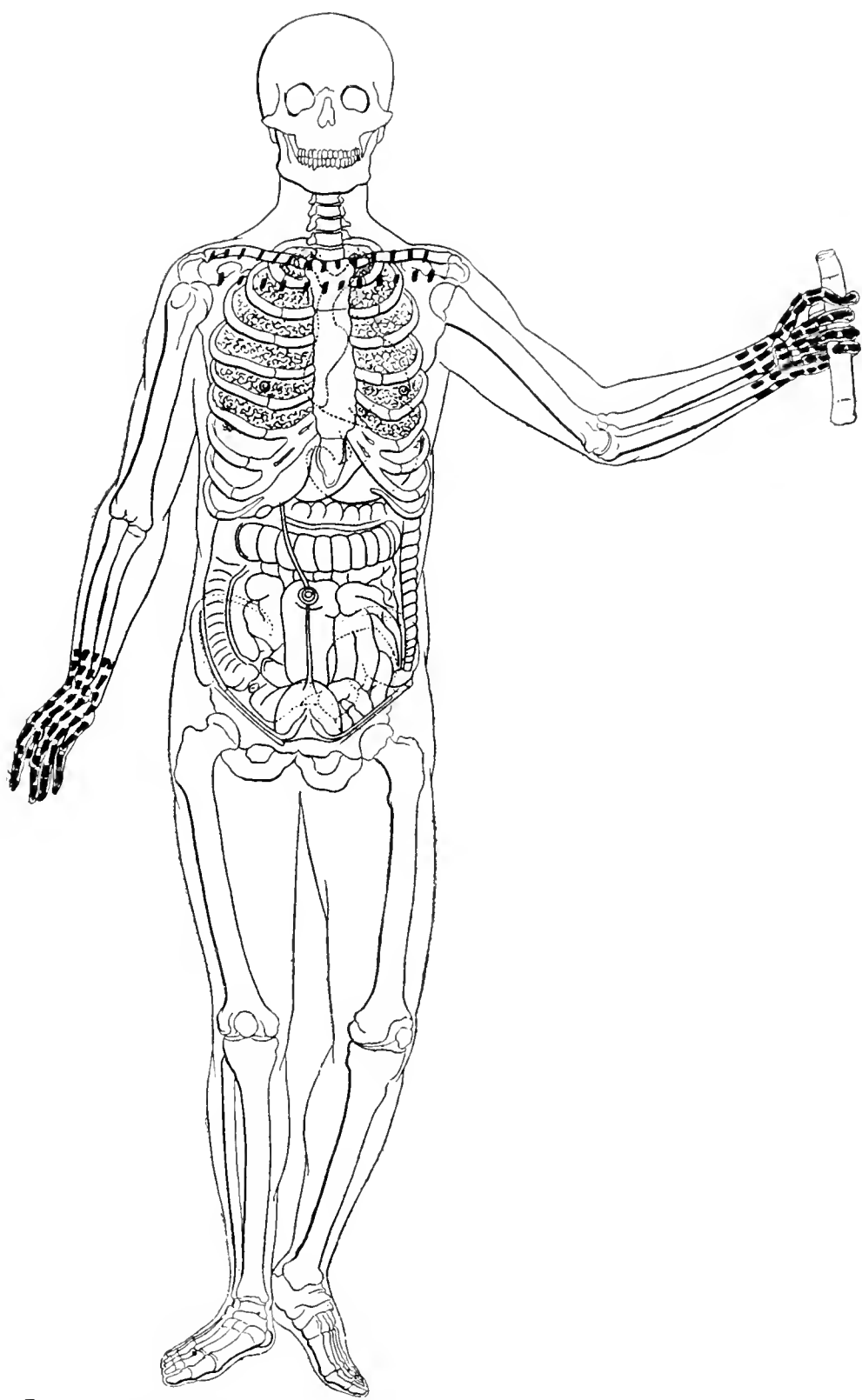
Charles Richet⁶ in his "*Recherches sur la sensibilité*" gives an exhaustive study upon the relations between mental states and disturbances of sensibility.

He very clearly shows that tactile sensibility differs radically from pain, temperature or muscular sensibility.

He distinguishes between peripheral hypesthesia, due to peripheral lesions of the nerves or cord, and central hypesthesia dependent upon morbid mental states, intense absorption of the mind, anger, hypochondria, dementia, etc.

In the former, tactile sense is blunted while that for pain may persist—so-called painful anesthesia. In the latter sensibility to touch is preserved while that for pain is blunted or entirely absent. Furthermore, this idea of central hypesthesia is not associated with prodromal features of pain or discomfort common to peripheral or objective anesthesia. In my cases, the patient was not aware of any loss of sensibility either to touch or pain until the tests were made.

According to Richet, in peripheral anesthesia sensibility is lost first to touch, then to pain, the muscle and temperature sense outlasting both, while in central or subjective anesthesia the loss first involves pain, tactile sensibility remaining late. Thus it would seem that touch was the more primordial sense with a deeper physiological relationship, while pain sense perhaps is more allied to psychical conditions.



Case 3. Marked hypesthesia in hands, lighter across upper thorax, indicated by shaded lines.

This blunting of sensibility is common among idiots and imbeciles, whose life thereby becomes a sort of a dream, withdrawn from the outside world.

Where intelligence is diminished the sensibility of the skin is lessened. To quote from his exceedingly interesting monograph: "Ches les mélancholiques et certains maniaques, une idee fixe empêche par sa persistance et sa prédominance, la sensibilité" (p. 272.)

Lombroso has noted this general blunting of sensibility among criminals, while others have called attention to its existence among the insane. Dr. W. A. F. Browne⁷, in an address at Dumfries in 1873 on Anesthesia, Hyperesthesia and Pseudoesthesia, chiefly as met with among the insane, concludes:

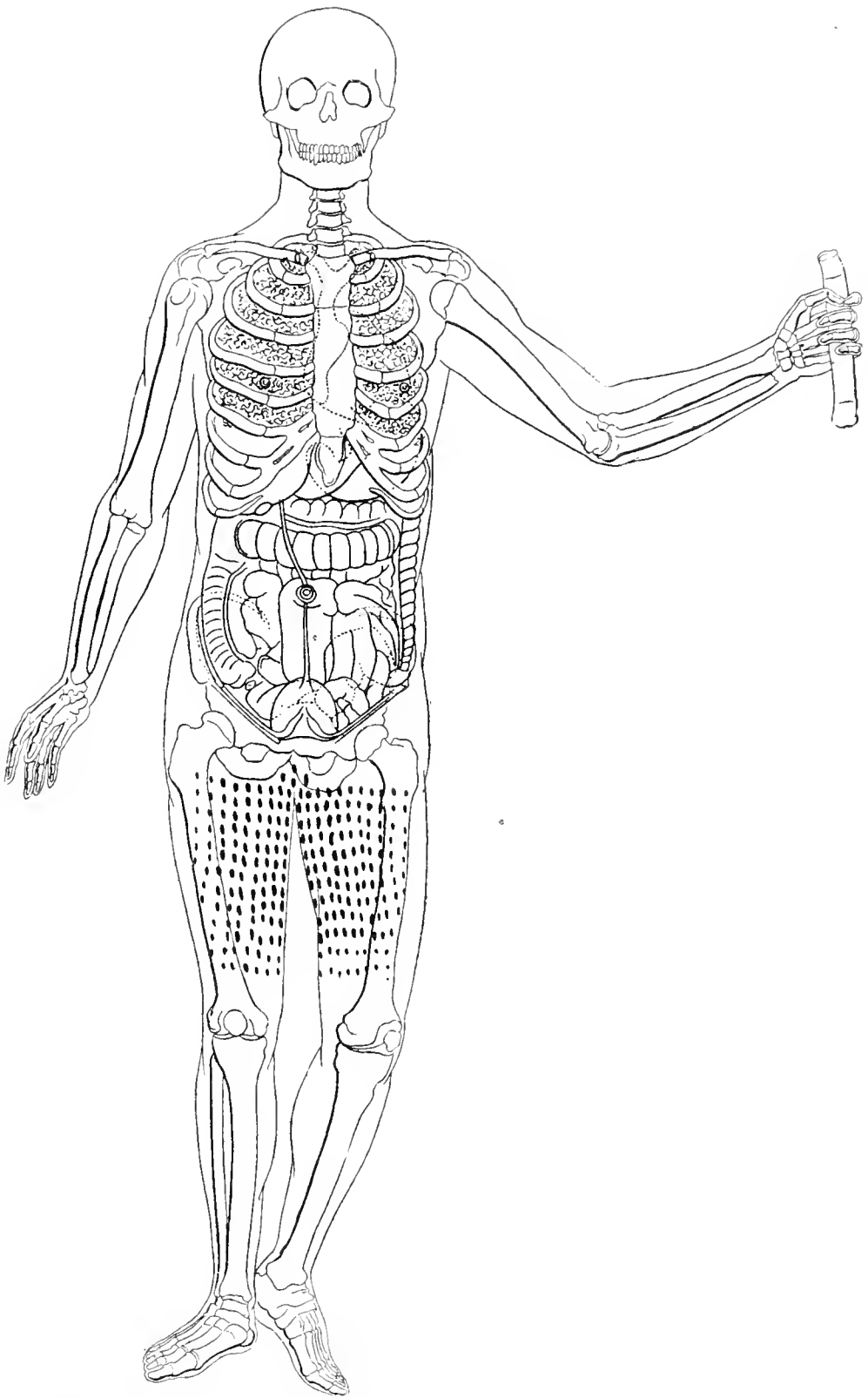
1. That the mind may be studied at the surface through sensations, as well as metaphysically through emotions and ideas:

2. That every mental condition projects for itself an ideation or reflection on the external senses which may so far reveal the character though not the nature or amount of departure from healthy action in the centers;

3. That in proportion as these indications are studied, analyzed and classified we shall approach a broader and more strictly psychological basis for diagnosis and treatment of mental disease and a more humane and philosophical interpretation of the crimes, the follies, the failings, even the foibles of our sane as of our insane brethren.

All the observations had, however, reference to a disturbance of sensibility, more or less general in character, and medical literature has little reference to localized areas of blunted sensibility and their relation to morbid conditions.

Head,⁸ the accomplished editor of *Brain*, in 1893 published the results of a study of "Pain from Visceral Disease Associated with Definite Areas of Hyperalgesia." In making his tests he simply used a pin for determining increased sensibility. He found that in certain areas of the skin related definitely with diseased conditions of the viscera, there was a marked hyperesthesia to pain, i.e. the skin of these areas was so hypersensitive that the blunt head of a pin felt as though it was the point, while the point itself of the pin was much more painful than in neighboring zones. He also showed that herpes zoster appears over exactly the same areas as those tender in visceral disease. The



Case 4. Dotted area represents location of subjective feeling and blunted sensibility.

skin reflexes also were increased in these tender zones. Visceral pain, however, never produces hyperesthesia, but always an exaggerated sense of pain—hyperalgesia. He concludes that centrally nerves for pain in skin and viscera are closely related, while nerves for heat and cold and trophic disturbances of the skin are in close association.

On the other hand, the tactile nerves of the skin are widely separated centrally from those of pain. Thus Head also noted the marked separation of touch sensibility and the sense of pain.

It is interesting to note that an associated press dispatch within the last week announces that the Marshall Hall prize has been awarded Dr. Head for his discovery of two distinct sets of sensory nerves, one conveying sensations of pain, heat and cold, the other conveying the sensation of touch.

Janet⁹, so far as I know, alone has called attention to the localized blunting of sensibility, and his reports are very suggestive.

Janet worked largely with cases of true hysteria and does not attach the same importance to the hypesthesias met with among milder grades of nervous disturbances. His study led him, however, to the assumption that the anesthetics were a phase of "absent-mindedness" due to the "feebleness of mental synthesis"—a sort of mental fatigue, and associated with "recession of the field of consciousness." It is true that he frequently refers to hypesthesia, both general and local but regards it as an indication of "hysteria in formation, the absent-mindedness as to sensations preceding hysteria." He also calls attention to the delayed transmission of sensation in these cases, and concludes that "anesthesia is an extended and chronic absent-mindedness, which prevents those subject to it from connecting certain sensations with their personality; it is a contraction of the field of consciousness."

He believes that the esthesiometer, however imperfect it be, may render here some service, even from a clinical point of view.

It is in the large group of neurasthenics especially that we find these slighter subjective or central disturbances of sensibility. The more definite anesthetics so common to hysteria are clear enough. Unquestionably the areas of hypesthesia in the neurasthenic approximate similar conditions of anesthesia among the

hysterics, and may be due to a mental perversion less in degree but similar in character.

In my own experience these areas of blunted sensibility are very common in neurasthenic cases. The disturbance in feeling is usually referred to some part of the body, as is well known, and upon examination I have found the overlying skin, or the area corresponding to the seat of the trouble more or less anesthetic. In testing sensibility the points of the esthesiometer—Carrol's—require to be separated double the distance or more above normal before the subject can appreciate the two points of contact. Or, if a pin is used, the point "feels blunt." "It does not prick or cause pain" is the usual response. Sensation to touch is somewhat blunted but reaction to pain is even more affected.

The central character of this hypesthesia is shown by the fact that the patient is usually unconscious that there is any disturbance in sensibility whatever until his attention is attracted to it. Let me illustrate by a few brief case histories::

Mild Types, Case I.—Miss S, aged 26, school teacher, nervous inheritance,—a neurasthenic. Morbid sensibility and depressed feeling referred to abdomen. "Is constantly conscious of her abdominal feelings." Examination shows these organs to be normal, but skin over affected area slightly anesthetic to touch, more so to pain. Treatment by cold water to abdominal area and brisk rubbing. Relief after ten days' treatment. Sensibility found to be normal.

Case II.—Mrs. H—, widow aged 38, good circumstances. Heredity, gout and rheumatism—of nervous temperament—experienced a severe fright when a child. Has various phobias. Refers her bad feelings to abdominal region. Marked blunting of sensibility over corresponding skin area. No organic disease.

Treatment: Static current applied specially to abdominal region. Marked improvement in nervous condition in three weeks, with restoration of normal sensibility.

Case III.—Imperative idea—mysophobia. Mrs. B, aged 38, Was much fatigued and worried while nursing a severe case of diphtheria—attending physician exceedingly scrupulous about cleanliness. Developed idea that her hands were unclean—constantly washing them. Later developed fear of lung contagion. A condition of depression and despondency, almost melancholia.

Marked blunting of skin on both hands, also to a less extent that of the thoracic region.

Treatment: Seclusion, nutrition, strong faradization of the affected areas. Marked improvement, with dispersion of imperative ideas and restoration of normal sensibility.

Case IV., Sexual Type.—Miss W., aged 29, good circumstances. Family history somewhat tubercular; personal health good except so-called attacks of "inflammation about the bladder."

Present attack was rather neuralgic in character with frequent painful micturition of normal urine. Urination has to be accomplished in peculiar manner. Pain like a flash, excruciating, affecting the pubic region and running down the right thigh—"as though hot water had been poured over it." Marked improvement during menstrual periods. Nerve had been cut by one physician for supposed neuritis. Emotional, erotic excitement although she denied masturbation.

Not much sensory disturbance but marked analgesia to strong faradic current about the vulva particularly in the clitoris and labia, which were somewhat tumescent. Some blunting of sensibility over thighs in areas of subjective feeling. Some hysterical stigmata.

Treatment by seclusion and use of strong faradic wire brush to re-establish normal sensibility. Gradual improvement in all symptoms, with re-establishment of local sensibility. At present entirely well.

Undoubtedly this disturbance in normal sensibility enters very largely into the altered feelings so common among neurasthenics, giving rise to imaginary ailments. I have found quite uniformly that when this blunted sensibility has been relieved and normal sensibility restored, the patient recovers. Even before I employed the esthesiometer with this class of patients it was a common experience that by replacing a morbid feeling in consciousness by a real one, i.e. by using massage, hydrotherapy, or even better the stimulating sting of the static current a marked improvement in feeling resulted.

The vague feeling of gastric, abdominal or pelvic disorder, when thorough examination of the aforesaid organs showed no disturbance, the only objective sign being hypesthesia of the overlying skin, is quickly dissipated by any appropriate sensory stim-

ulation. The interval of freedom from disturbed feeling does not last long at first, but more is gained at each treatment and eventually the disorder in consciousness—for it is psychical not physical—is relieved. Imperative ideas likewise when they have a local habitation can thus be defined objectively through blunted sensibility and relieved by a similar plan of treatment.

These subjective phenomena are not chimerical even though they have eluded pathological and laboratory investigation. They have definite representation in this sensorial disturbance and can be eliminated by appropriate treatment—not by reasoning or suggestion but by directly correcting the error in consciousness caused by localized lapses of sensibility.

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THE COMING OF PSYCHASTHENIA*

BY G. ALDER BLUMER, M.D.,

OF PROVIDENCE, R. I.

If the proverbial question, "What's in a name?" were put to any member of this Society, his opinion would hardly accord with that of the poet whose sophistical answer has been leading men into a paradise of fools these many years. From time out of mind psychiatry has suffered greatly from archaic and faulty nomenclature insomuch that the innocent sufferer from the psychoses has been as a reproach among men while his disease has been looked upon as a pariah in nosology. Much as one may regard the *nomen* as a mere *flatus vocis*, it is nevertheless true that names, and not alone the things themselves, are to a large extent responsible for the wrongs which the sick of brain have suffered at the hands of unenlightened men. The word "madman," though occasionally heard in England, is happily no longer current in America, but our ears are still affronted with "lunatic" and "lunatic asylum," even in cultured New England, and we must all plead guilty to the unnecessary use of the words "insane" and "insanity" when some more scientific euphemism would serve the purpose of description as well if not better. Neurologists, practising in a populous and fertile border country and making incursions ever and anon into the debatable territory of the psychiatrist, have been wiser than we in appreciating the importance of giving morbid states pleasing appellations. If it be true that an alienist, Van Deusen¹ of Kalamazoo, was the first to describe and name the symptom-complex which for over thirty-six years has been known as neurasthenia, to Beard, the neurologist, belongs the credit of having popularized the name by his larger clinical studies and made it a household word throughout a world now so "civilized" that the conditions under which it flourishes, being well nigh universal, no longer give this country a prescriptive right to its derisive sobriquet, "the American disease." It may well be that some so-called neurasthenics, lulled into a comfortable sense of security by a name that

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was a misfit, might have fared better in health had they been otherwise labelled and undergone treatment in institutions, but I venture to believe that occasional evil therefrom arising has been offset by the countless instances in which men and women have recovered from a psychosis without knowing, or having had it made known, that they had suffered from what is called insanity. Albeit it was inevitable that a term so comprehensive and so universally popular as neurasthenia, and so vague withal, should be made to include from year to year more and more of those cases in which not only the motor and organic energy of the individual are reduced, but in which the "psyche" is too profoundly involved to warrant the all-embracing designation as one still within the bounds of a reasonable scientific exactness. Nothing therefore could have been more timely than the paper read by Dana² before this body nearly two years ago on "The Partial Passing of Neurasthenia," a felicitous title, by the way, to which I am indebted for the antithetical caption of this humbler essay. The author's contention was, you will remember, "that a large number of these so-called neurasthenias and all the hysterias should be classed as prodromal stages, abortive types or shadowy imitations of the great psychoses." For in these cases, said he, "it is the morbid mind that dominates the situation, not a weak eye-muscle, a poor stomach, a heavy womb, uric acid, arterial sclerosis, or even an exhausted motor nerve cell. They are not often, to be sure, pure psychoses; the body is also at fault, but the psyche is in main control and it gives the stamp to the syndrome, directs the prognosis and most acutely solicitates treatment. Many neurasthenias are only a kind of understudy of some particular type of insanity, or they make the forming stage of some major psychosis which, perhaps, under wise direction never fully develops." The pertinency of this clear-cut statement to my present purpose must be warrant for the full quotation.

To those of us whose activities lie rather in the domain of mental diseases, it was refreshing that one who is primarily a neurologist should have been among the first in this country to suggest so large and important a concession of territory and thereby to have averted the reprisals which otherwise, sooner or later, were bound to have been made, openly or furtively, by men militant on the other side of the line. His paper has gone a long way towards clinching the essential unity of nervous and mental

diseases and establishes a *modus vivendi* whether we profess allegiance to either camp or both.

Whether Dana's "phrenasthenia," a name that has long had a vogue in France, is on the whole as desirable and as likely to survive as that for the recognition and adoption of which it is my business to plead this evening, time will prove. With the backing of its inventor, Janet, *facile princeps* in his chosen field, *psychasthenia* seems to bid fair to prevail against other comers as best descriptive of the grand psycho-neurosis which that investigator has described and named.

And here it is pertinent to remark that to Janet, more perhaps than to any living scientist, we are indebted for enabling us to look at mental diseases in a changed and vastly broadened perspective. In a recent address on "The Present Decline of Art in Medicine,"³ Sir Dyce Duckworth points to the importance of enthusiasm, sympathy and sound judgment in applying principles to the case of each individual. The lesson of the true perspective must be learnt in the school of experience, as well as the harder lesson—an especially difficult one in dealing with mental cases—of getting at the patient's own perspective of his symptoms. The art of practice which Sir Dyce Duckworth had in mind cannot be acquired from books or even in laboratories, but only by long and careful study of individual patients. Such is the art which Janet is helping us to-day to make more and more our own. We recall that in that remarkable paper on "Mental Pathology" read at St. Louis last year⁴ he pointed to the tendency of investigators in other countries to separate two branches of study which French alienists are disposed to unite. "They study on the one hand the psychology of the normal individual, or the individual who is regarded as being normal, and on the other hand they are concerned with mental diseases, their analysis, and especially their classification." Frenchmen, however, under the inspiring leadership of Ribot and Charcot "have endeavored rather to throw light upon psychiatry by a study of normal psychology, and to regard mental diseases as experiments which have been cunningly devised by nature to show us such suppressions and modifications of function as the experimental method demands." In other words, they have insisted upon the union of the psychologist and the psychiatrist in a common investigation—a union, the importance of which we in America have but begun to realize within compara-

tively few years. Thanks to that union and the resultant closer analysis of mental symptoms, "psychological experimentation has introduced into psychiatry a rehabilitation and a refinement of the clinical method."⁴ Neither may we forget, in estimating our obligation to other students in this field, what we owe to the work of our fellow-member, Dr. Cowles, who was well in the forefront with his studies on "The Mental Symptoms of Fatigue"⁵ thirteen years ago and set out bravely to discover a way to reduce the data of everyday psychology to orderly form and to recognize the import of commonly observed mental manifestations by noting their correspondence with recognized bodily conditions. At that time the voice of Dr. Cowles was as of one calling in the wilderness: to-day we recognize him as the earliest American herald of the psycho-neurosis under consideration.

In psychasthenia it will be observed that the deviation from the normal is qualitative rather than quantitative. Loss of memory is not apparent—neither attentive nor recollective. Indeed, memory is often far above the average. Neither is there evident impoverishment of ideas or weakened power of comprehension. There is no stupor and no disorder of consciousness. But there is a reduction of volitional power, as well as that of prolonged and systematic attention. In a word, *aboulia* is a cardinal symptom. There is a constant intellectual play of a diffuse sort which results in ever-changing imagery and phantasy—an activity that displays itself in brilliant constellations of ideational design which are totally lacking in that orderly succession, arrangement and development which are necessary to productivity. Psychasthenics are dreamers. Their ideational life cannot be brought *en rapport* with the physical and the actual. They have perspicuity but lack the volitional and attentive power to make that keenness of mental vision an available factor in dealing with the everyday problems of life. They stop short of definite delusion, although their dreaming proclivities lead them to the formation of all sorts of delusive and elusive conceptions, the whimsical unreality of which they themselves recognize when brought sharply to book. Similarly there is no sensory disturbance in the sense of true hallucination, although the same ideational activity leads the patient to vivify and objectify his thoughts and so to perceive them as voices and visions, thus leading one to confound the phenomenon with genuine perversion of the special senses. Mental opera-

tions, instead of resulting in co-ordinated and productive activity, find vicarious and devious expression in multiform obsession. In other words, there is a lower order of mental activity, capable, it may be, of dealing with the past, the future, the indefinite, the intangible, but woefully impotent to meet "the various exigencies of times and occasions." Before such realities the enfeebled spirit balks and is constrained to find the line of least resistance. Scruples and diffuse rumination replace decisive judgment and well-balanced logic; phobias and anxieties usurp all useful and legitimate emotions, while tics, mechanical impulsions, mannerisms, stereotypy and motor agitation are the aimless substitutes of energetic behavior. This incapacity reacts again upon the individual consciousness, producing what Janet has so aptly named *sentiments d'incomplétude*. Faced with situations demanding action, the subject is overwhelmed by feelings of incapacity, inutility, indecision, humility, shame, automatism, difficulty, discontent, domination, intimidation and revolt; in the intellectual sphere he feels obscurity, strangeness, unreality, doubt, instability, isolation, disorientation; while his emotional activities are expressed in anxiety, ennui, indifference and restlessness.

This picture is not one of true dementia, and if heretofore we have given that name to the symptom group, it is time for us to revise our nomenclature. In the sense that there is a reduction of the energising power to the extent of producing a pervasive disharmony in relation to environment, there may be what, for lack of a better name, has been called dementia, but there is little or no blunting and diminution of the intellectual activity *per se*.

Having thus attempted to describe psychasthenia, let the cases here brought together from the records of Butler Hospital eke out effort by furnishing living pictures of the psycho-neurosis. In presenting these excerpts I desire to make grateful acknowledgment to Dr. Wm. McDonald, Jr., for the thorough studies which they embody.

Since January 1, 1903, there have been discharged from Butler Hospital 270 patients; of these 134 were men and 136 women. Forty-one were diagnosed as *psychasthenics*, i. e., about 15.1 per cent.; of these 18 were men and 23 women. At the present time there are 9 psychasthenics in a population of 162, i. e., 5.6 per cent.; of these 5 are men and 4 women. The difference in the

percentage of psychasthenics discharged and those remaining in the Hospital is readily explained by the comparative curability, or at least improvability, of psychasthenia as compared with the more hopeless diseases that are chronic and accumulate.

Of these fifty psychasthenics the most careful records have been kept and exhaustive examinations have been made of both the physical and mental states. It would be wearying to refer in detail to all of these cases, and, moreover, would necessitate frequent repetition, since they all seem in many ways to have been stamped with the same die. Grouping the symptoms therefore according to the beautiful scheme presented by Janet, we proceed to give illustrations by brief abstracts from the more characteristic case records. We have then to illustrate:

1. Fixed ideas (obsessions, *Zwangsvorstellungen*.)
2. Fixed mental habitudes, or fixed mental processes (*agitations forcées, Zwangsvorgänge*.) These latter are further divided into (a) motor agitations of the systematized form (tics) and of the unsystematized (diffuse agitations), (b) emotional agitations, including the systematized variety (phobias) and the unsystematized (diffuse anxiety), (c) intellectual agitations composed of the more definite and systematized processes (scruples, *manies d'interrogation, manies d'hésitation*), and the unsystematized diffuse mental agitation (i. e., inability to stop thinking, indefinite and prolonged rumination, etc.)

Case I. P. T. M., an intelligent man of 32. Summary of examination: physically is fairly well nourished, and there is a general appearance of healthy physical tone. The nervous system shows some irritability and instability. There is tremor of the fingers and legs and cardiac irritability and irregularity.

Mentally, the marked symptoms are obsessions, tics, phobias and scruples. The obsessions consist of constant dwelling upon the subject of sexual perversion, and wondering if people might suspect that he might be an invert (patient's sexual life is really normal). Moreover, dwells constantly on the condition of his body, has many hypochondriacal obsessions and is particularly disturbed by constant thought as to the condition of his mouth and quantity of saliva. Associated with this last there is a tic, consisting of a sucking act performed with the tongue and cheeks with the object of drawing saliva into the mouth. As a sequela to this there is constant swallowing of saliva, which is accom-

panied with an occasional slight gurgling sound. There is, moreover, diffuse rumination with tendency to dwell upon past sorrows, upon his own prospects and capabilities. Has diffuse anxiety regarding sleep and the possible recurrence of certain spasmodic movements of the sexual apparatus. There is no evidence of hallucination or delusion. Patient talks well, reasons well, writes unusually well for publication, and shows a high grade of intelligence. There has been no dementia. There is no disturbance of consciousness. Comprehension is excellent. Has no deep grade of depression. With this patient there is considerable admixture of neurasthenic symptoms, i. e., tremor, cardiac irritability, etc., but it is the mental symptoms alone which cause him to seek treatment.

Case II. A. M. G., a woman of 26. When about twelve years of age whenever she walked around a corner she felt a desire to repeat the process. She finally began to indulge herself in this habit, arriving late at school because of this repeated action. Then she developed a desire to touch objects many times. If she laid a book on the table, for example, she felt impelled to touch it over and over and was unable to draw herself away from it (tics). About this time she had a great fear of comets, was easily influenced by sermons and had much religious feeling. A year before admission, while working hard at bookkeeping, she began to lose sleep and was inclined to weep easily. After reaching home each night would break down and shed copious tears. She was very undecided in her actions; says she lost all will power. For a long time previously had been troubled whenever turning off the gas with the feeling that she must go back and ascertain if she had really turned it off completely; the same with locking the door; these acts had to be done over and over (tics, *manies de précision, vérification*). She began to feel that some one must be with her to tell her that she must not go back and test the door or the gas cock. Soon she found it necessary to go over her columns of figures to verify the addition; began to have hot and cold flashes; in dressing in the morning would put her shoes on, then take them off again eight or ten times, being unable to decide whether she should have put on the right or the left shoe first. A complete breakdown followed, and she remained in bed for two or three weeks. While in bed, inasmuch as she could not arise to perform certain acts over and over, she felt it

necessary that her mother should repeat them for her. If the mother were sweeping the room, she must sweep certain portions frequently, or if she came into the room where the daughter was thinking of something unpleasant, she must go out again and come in a second time. If the unpleasant thought was still in the daughter's mind the mother must repeat her act as many times as might be necessary.

"I don't know how many times I had the medicine glasses changed for various reasons. They offered it to me in a certain glass and I said, 'No, I don't want it in that glass because it's the last of the kind in the house.' " With the next glass there was some other reason for refusing, etc. If the mother went out to buy sugar the daughter insisted that she should take only a five dollar bill and that she must have the sugar done up in two-pound packages and must receive in change two two-dollar bills which the mother must show to the daughter on her return. Always superstitious; would not take the last biscuit for fear of being an old maid; would not count the carriages in a funeral procession; did not like to do anything on Friday or on the 13th of the month, etc. When sewing she found it necessary to rip out the seams as fast as she put them in, the reason being that she had a certain thought in her mind when the work was done and she should have had some other thought. If a certain thought was in her mind when she put the needle through the cloth she must take it out again through the same stitch-hole and put it back again with a different thought if possible (scruples). She gradually became worse, was unable to sleep nights because she must work out certain geometrical forms with her hands (tics). If the hands remained quiet she must imagine the hands drawing out these figures in the air (mental tics; i. e., *agitations systématiques*). She must work out geometrical shapes in her mind, "mental geometrics" as she called them. When walking she conceives these geometrical forms to rise from the feet and to disappear against the opposite wall or trunks of trees; these forms most often have the shape of a tomahawk, so she speaks of them as tomahawks (symbolic hallucinations.) If the form strikes against the wall or something solid she must go back and walk over again and sometimes this must be repeated fifty or a hundred times. Her steps must come out even at the end of a walk, or, if there are figures on a carpet, she must step over them in a certain way

All her actions she repeated by the square ; e. g., if, while blowing the nose she thought of death, she would have to repeat the act twice ; if again she thought of death it must be repeated four times ; if the same thought again occurred the act must be repeated sixteen times, and so on. She spent all of one forenoon going to and from the dining room because the number of times the act was performed had to be squared each time it was done incorrectly. On going downtown she must always come and go the same way.

At the hospital the same symptoms were in evidence ; e. g., she must dress and undress a number of times and it was necessary to have a nurse with her constantly to see that she did not perform these repetitions. The summary of mental state shows consciousness unclouded, good comprehension and excellent intelligence ; she is bright, able to converse readily and to intersperse witticisms. There are no delusions and no evidence of hallucinations. Most striking symptom is a compulsion toward certain acts (*agitation forcée*). Characteristic of this peculiarity is the compulsion toward a certain line of action accompanied with intense desire for its accomplishment and a feeling of unrest and anxiety if the action is not performed. There is a moderate degree of depression at times. Power of voluntary attention is diminished by the occupation with the above mentioned morbid processes.

Case III, J. H. Age 50. On the night of admission patient was directed to live so far as possible a natural life in the institution, to obey orders and to desist from talking about his own troubles. He immediately asked, "Must I not talk about them to anyone? Do you mean to the doctors or to the patients?" Having been answered, he proceeded to analyze the problem and to suppose various circumstances under which he might be placed and in which it might be convenient or inconvenient to answer or not to answer certain questions. For two days after admission the same problem bothered him, and he has begged anxiously for a definite answer on every occasion on which he has seen the doctor. The following notes, taken in shorthand, will show how closely he adheres to the same problem.

(What do you think of the grounds?) "The grounds are all right, Doctor, and you are all right too. I don't want you to get angry. I was only wanting to ask a little assistance. I don't want to get you angry or anybody angry." (Then why do you

persist in asking that question?) "Well, I tell you I thought it would help me to obey the rules. I don't want to say it if I thought it would go against your rules, but I want to have as much freedom as I can to help myself. When I said I didn't feel so well I only wanted to know if it was against your rules." (Haven't I told you at least forty times to drop that out of your mind?) "If anyone asked me if I was feeling well or all right this morning, if I said I wasn't feeling so well, was that against your rules? What would you want me to say?" (What is your chief trouble?) "Scruples, it seems to be. What would I say in that case to please you? If anyone asked me how I felt this morning, what would I say? Hold my tongue, or what would I say?" (Tell them to mind their own business.) "Well, that would keep a man from being friendly. I am sorry you won't answer me that question, Doctor. I have only tried to ask in a good friendly way." (Let me hear you talk about the weather.) "Yes, of course. It is a nice clear morning. You have nice shade trees. You've got a nice lawn. Do you want me to go on?" (I want to see if you can keep off the other subject for two minutes.) "I was out for a walk with the fellows this morning and they say, 'How are you feeling this morning?' If I am not feeling so well this morning, you have no objection to my saying that?" (No.) "Thank you, Doctor. That's the bottom of that subject." "The doctor said to me, 'Let it go at that,' when I asked him that question. I told him I tried to let it go at that. If anyone asked me how I was feeling I could say, 'Let it go at that.' I might vary it a little—but I will try to do what I can. I might say I didn't feel well this morning; that might—" (I thought you had dropped the subject.) "Well, if they asked me how I was and I said I didn't feel well this morning,—could I say that?" (Didn't we decide that a minute ago?) "Well, well, it's something the same. For instance, if I said I didn't feel well this morning, would there be any harm in that?" (Isn't that the same?) "Well, they are something the same,—I didn't feel *so* well this morning and I didn't feel *well*. If I said I didn't feel *well* or I didn't feel *so* well—could I say either?" (Doesn't it strike you as ridiculous that a man like you should come down to making such distinctions between words?) "Yes, it does. I feel as if I was trying to live a straight life, and it seems the more you try the worse it seems to be. You allowed me to say I didn't feel

so well. For instance, I say I don't feel well this morning. Is there any harm in saying to a patient, 'I don't feel well?' Am I allowed to say that? If I don't feel well am I allowed to say that?" (Yes.) "Thank you, Doctor, I am much obliged. I asked you this morning for a little assistance and now I've got it. They ask if you've got your bath and if you've got your medicine. I said, 'Yes, I've got my bath and I've got my medicine! Now, is there any harm in speaking that way, Doctor?' (Now, drop it.) "Will you just answer me?" (No, I won't answer.) "You might try to help me out just so that I'd be cheerful myself. You allowed me to say I didn't feel well or I didn't feel so well this morning, didn't you? Is there any harm in my speaking about my medicine or the bath? I wouldn't think there was any harm in that." (How much is 8 times 6?) "8 times 6 is 48. If you would tell me what I was allowed to do I could be about more freely, but you won't. 'Did you get your medicine last night?' Is there any harm in my speaking about that? Now, Doctor, don't get angry. I just want a kind of rule to work by."

While the patient was growing very much excited in an argumentative way over these questions, he was forcibly seized and placed before a bench on which worsteds were thrown, and was loudly commanded to sort them. At every attempt that he made to speak he was rudely interrupted and told to keep silent. Finally he became interested in the work and for some minutes refrained from speaking, except concerning the worsteds. Having finished the task, when he showed signs of referring to his scruples again a watch was thrust into his hand and he was commanded to keep absolute silence for seven minutes. He was very uneasy during this period, shuffled about much with his feet and once or twice showed a tendency to break through the silence, but, with encouragement, succeeded, saying finally with a smile, "Here is your watch, Doctor." Thereupon, he began where he left off, saying, "Doctor, when you put that watch into my hand you interrupted something I was saying. I want to know only,"

Case IV, C. S. S., aged 72, chronic psychasthenic. Has had all sorts of diffuse and systematized *agitation forcée* for years. An illustration of this obsessional conduct appeared when the physician was making his physical examination. Just previous to this examination the patient had used his chamber and upon getting into bed was seized by the thought that the carpet had

been soiled. The nurse was called and, after inspection, reassured the patient. This did not satisfy him and he recalled the nurse for a second and even a third inspection. Following this the nurse left the room whereupon the physician was asked to continue the inspection and then the patient himself started on a tour and after repeating this once and attempting a third scrutiny was forcibly made to desist. In the summary of the case there is, physically, little of importance to record, the old gentleman being remarkably well preserved for his age and having retained a fairly strong physique. He is still bright and has a strong memory. There are no delusions or hallucinations, in fact, the mental symptoms can all be summed up in the words *obsession* and *scruple*.

Case V, A. W., a patient aged 52. Summary: patient shows her psychasthenic tendencies in several characteristic directions; both phobia and obsession are well marked. She is extremely hypochondriacal. There are states of marked anxiety, amounting at times almost to anguish, arising from what would be insufficient provocation in a normal individual. Moreover, she recognized the morbidity of her own symptoms. The motor mental compulsions appear in the necessity from which she suffers of constant searching for and dwelling upon quotations referring to hesitancy, selfishness, etc; i. e., verses àpropos of her obsession, lack of confidence in herself; e. g., says she could repeat every verse which refers to her characteristics, as, "He who hesitates is lost," "All hope abandon, ye who enter here." etc., etc. Her whole life has been made miserable by her constant desire to change her abode and circumstances of life no matter what these might be. No sooner had she decided upon one course of action and begun it than she was troubled with fears and anxiety that she had chosen the wrong one. There is one characteristic strikingly suggestive of phobia; namely, the fear that in remaining in any place she has moored herself to it for good and all, resulting in the immediate striving to change her abode. She is more than ordinarily influenced by superstition; i. e., as to the number 13, Friday, etc. She is as yet very intelligent. There has been no mental deterioration in the sense of an absolute loss of power although the scope of this power has been greatly narrowed. It is characteristic of her condition that immediately following the examination she be-

came extremely distressed by the fear that she had talked too freely.

Case VI, P. F. L., aged 33, a patient of good intellectual capacity upon whose services as stenographer her employer has put the largest possible value. She is troubled particularly by obsessions of the nature of shame of her body, of her character and of her acts. Says she has such shame in going to the office mornings that she has hesitated many times in going downtown and has often walked out of the way in the endeavor to get up her courage to the point of entering the building. When in the office she had all the shame of a great criminal and suffered veritable anguish of mind. There is some act of childhood over which she worries although she knows that it was not an unusual sin, (i. e., there is an abundance of delusion of sinfulness) feels, however, that she ought to confess this act. Thinks that if she is to get any help in the hospital she must tell all about this and yet she refuses to tell it, deciding to postpone the confession. She talks very well and analyzes her own trouble; realizes entirely the pathological nature of it and its possible disagreeable consequence. She shows no great emotional depression at the time and laughs heartily with the physician at proper provocation though there is an air of weariness and *ennui* about her actions and a similar expression on her face. She attends well and her memory is evidently undisturbed. This patient made three distinct suicidal attempts while in the condition described but, as in each case there was nothing to prevent her completing the act, it may be concluded that her decision and desire in the matter were not positive.

Case VII, M. S., age 29. Has feared for a long time that she might strike someone, though she has never been violent. Said on the day following admission, "I was afraid that I would strike the patients. I went near them and talked to them but all the time I wanted to strike them and was afraid that I would. At home I have got so I think all the time of knives and that I am going to strike my husband with them (phobia). I didn't want to but I was afraid I would so he took them away. I have all kinds of ideas in my head. I've got more ideas now than I had when I was home. Sometimes I feel that I would take my clothes and tear them. I didn't do it and I don't want to do it but I am afraid I am going to. When I see anything I think I

ought to go and hit it though I never had any such idea before (systematized mental compulsions). It seems to me that I am right in my head, I know everything."

Likewise in Case VIII, C. A. P., a married woman, age 48, we see a condition very similar to the last. "Why, it's terrible. I have just the best boys in the world. They are not like many boys. They like to kiss their mother and they are all the time putting their arms about me and kissing me and it seems as though I couldn't stand it. I feel every minute that I would strike them." On account of these thoughts she is unable to read or to do anything. She frequently has distressed feeling, trembles all over, is restless, unable to sit at a table, (diffuse motor and diffuse emotional agitation) "and then there are these awful thoughts; they are all in my own self. How foolish to have to think of your own self all the time and not once of anybody else. I can't think of anyone else. At night when I try to go to sleep and try to think of things it's always myself that I think of" (diffuse mental agitation). Complains particularly of inability to concentrate her thought and of the desire to avoid society and yet a fear of solitude.

Case IX, C. A. T., age 64. Patient has never had hallucinations, illusions or delusions. Consciousness is entirely unclouded. There is no impairment of comprehension. The grade of attained intellect is above the average, patient having devoted his life to theological and ministerial duties. The rate of association is prompt. The particular weaknesses noted are those of a chronic and continuous sense of fatigue with vague and various obsessional ideas of physical and mental incapacity, combined with hypochondriasis. For a long time past he had been unable to indulge in mental or physical diversion without the immediate intensification of these distressing complaints. The neurasthenic symptoms in this case are unusually well marked. There is pain across the shoulders. There is weakness, an all-gone feeling in the legs; some loss of weight, indigestion, headache, constipation, sense of fullness and pressure in the head—calls himself "a mere bundle of nerves." This is a case which might, perhaps with justice, lay claim to the diagnosis rather of neurasthenia than of psychasthenia.

Case X, M. W. R., age 43, shows a curious obsession. Has great anxiety as to his present appearance and particularly as to

his neckwear. He exhibited great uneasiness when being undressed for the examination and frequently made motions toward his collar and necktie saying, "I don't like to go around with nothing around my neck. I want my tie on. There was a time when I used to have to wear one of these cravats around on my night-shirt. I thought it looked so much more dressed. Yes, I think I could have left it off but I felt so much more comfortable with it on." This patient also has the fear of hurting people. (How about this fear you have of injuring others?) "I have had that fear, yes." (How did you think you might injure others?) "Well, I suppose—. That is a very painful question to have to answer." (Why so?) "Nothing, just because the very fact that I have such a horror of it that I kept feeling that I was going to do it." (Did you have in your mind any particular way of doing it?) "I suppose with some sharp instrument." Patient has a very marked phobia as to razors and sharp pointed instruments.

Cace XI, C. A. V., a woman, aged 47. (How do you think you were morbid as a child?) "Well, merely in thought that I would have. I have always been blue." (Have any peculiar thoughts as a child?) "I don't know. I do now. I think I was always queer." (In what way?) "I don't know." (As a child did you have any tendencies to wonder if you had done right or wrong about things?) "Yes." (And did you go into little things of life?) "Everything." (On the way to school would you take a certain number of steps around a corner or have to go back and walk around it again?) "About as foolish as that. I have been foolish that way all my life. I never spoke without after I have said it I would wonder how it sounded. I seem to be sort of a double while I am doing a thing mechanically. Seem to be living out a dream or a romance or something like that; doing two things at a time." (That is when you stop to think of it afterwards?) "Seems as though I am all the time, and it seems to me I don't do things and feel as other people do. I wonder what might happen and what is going to come of it." (Does that go back over your whole life?) "I think it goes a good ways." (Were you troubled in childhood by these questions?) "Well, I don't think I thought so much about them. I would look at a tree, for instance, and think what is that tree for and why do they have to have trees. It goes on mentally." (Did you as a child

ask these questions?) "I expect I did." (Do you remember that you did?) "Yes." (Has that been a lifehood characteristic?) "I think it has." (Has it kept you from your work?) "I think it has kept my mind divided. It's 20 years that just as soon as I haven't been pushed actively in teaching I am almost as bad as I am now. My vacations have been just torment. People call it physical trouble. It is physical because I have all this pain and everything the matter that can be—myalgia, sciatica and lumbago."

(When did you begin to break down this time?) "This summer, through July I tried to brace up and tried to pretend I was somebody." (Have you been troubled? What has been the worst thing?) "I don't know; it's indescribable. The worst thing is that I think I am going to be insane. All my friends say I am not, never will be and the doctors say I never will be." (What keeps you awake at night do you think?) "I don't know; things going over and over." (Have difficulty in dropping things?) (Of course I do. One little tune or some little quotation will go on and on and on and my eyelids will droop and I will wake up and it will be going on just the same." (A quotation that applies to yourself?) "No. The chief thing one night seemed to be a little song of some primary school: 'They are coming all humming to their straw-covered home.'" (Do the pictures on the wall bother you?) "Oh, yes. Have to count and count and count." (Are you uneasy unless you finish the count?) "Yes."

I shall not take up your time by analysis of the foregoing cases since patient and case are here the voice speaking, as it seems to me, without uncertain sound and rendering unnecessary any echolalia on my part. What has been omitted—and I realize that I have but touched the hem of a rich garment—may be brought out in part by discussion. But I may refer the eager student to Janet's paper on "The Psycholeptic Crises,"⁶ as read before this Society and as it appears in the well-fitting English dress fashioned for it by Dr. Courtney in the *Boston Medical and Surgical Journal* for January, 1905. A more recent paper by the same author is "Les Oscillations du Niveau Mental,"⁷ in which the attempt is made to show that all the symptoms of psychasthenia are dependent upon oscillations of the mental level.

It seems important to remember that psychasthenia is a condition, not a disease *per se*, and that its interpretation as such

should be widely extended. It is an exhaustion and not strictly a defect psychosis, although it may owe its evolution to inborn weakness and instability. Many of its finger marks may be recognized in the beginning stages of other diseases, e. g., in general paresis and dementia præcox. It is found also in the manic-depressive psychoses in the shape of tics and obsessions, and, as shown in one of the above cases, it may reveal itself in senile dementia.

Finally, by way of summary, it may be well to give here the five main types of psychasthenia which are recognized by Janet¹ in a division based upon the degree of the morbid mental condition. (1) The simple neurasthenic with physical and moral depression, but without any accompanying sense of disease; (2) the patient who feels acutely and suffers from his state of depression and who, in this respect, has very varied sensations of incompleteness (*incomplétude*), as yet fairly accurate, but showing a general tendency to exaggeration and generalization; (3) the patient who to these latter adds diffuse agitations, especially in the affective and motor fields; in other words, one who has crises of agitation and anguish; (4) the patient whose agitations are systematized in such way as to reproduce always the same form of anguish, or the same mental process with respect to the same occurrences; that is to say, the patient who presents tics, phobias, or mental manias; (5) the patient who sums up all the preceding disorders in obsessional ideas of disease, of shame, of crime, of sacrilege, which may express themselves either by crises or more or less continuously, whereby would be determined, of course, varieties in the gravity of the obsession itself.^{8 9}

And so far as the form taken by the *evolution* of psychasthenia is concerned, a form which depends greatly upon character and previous education, Janet distinguishes three types according as the symptoms are principally in (1) the motor, (2) the affective, or (3) the intellectual field.

But one word more. We have been witnesses of stirring events in psychiatry during the past dozen or so years. History has been making rapidly. Dementia præcox has come and taken so firm a hold upon the American imagination that a cynical confrère over seas had declared that in our country "everything it dementia præcox from idiocy to general paralysis." Let us beware lest in our Athenian zeal for new things we overload

this latest psycho-neurosis till *ruit mole suâ*. Of us, perhaps, more than of more conservative peoples, it may be said:

"Man wants but little here below,
Nor wants that little long."

And yet, is in this special plea for psychsthenia, I have seemed to throw dust in the eyes of the jury, there is for the pleader at least a temporary refuge in that other homely saying, "One story is good, till the other is told."

¹"Observations on a Form of Nervous Prostration (Neurasthenia) Culminating in Insanity." Supplement to Annual Report for 1867 and 1868. American Journal of Insanity, April, 1869.

²Boston Medical and Surgical Journal, March 31, 1904.

³The Lancet, Nov. 25, 1905. Editorial.

⁴The Psychological Review, Vol. xii., No. 2-3, March, May, 1905. Translated by J. W. Baird, Johns Hopkins University.

⁵Transactions of New York State Medical Association, 1903.

⁶"The Psycholeptic Crises." Boston Medical and Surgical Journal, Jan. 26, 1905.

⁷"Les Oscillations du Niveau Mental." La Revue des Idées, No. 22, Oct. 15, 1905.

⁸"Les Obsessions et la Psychasthénie." Vol. ii., p. xxii.

⁹"Psychasthenia. Its Clinical Entity Illustrated by a Case." Sidney I. Schwab, M. D. THE JOURNAL OF NERVOUS AND MENTAL DISEASE, November, 1905.

Periscope

Brain

(Summer, 1905.)

1. The Afferent Nervous System from a New Aspect. HEAD, RIVERS and SHERREN.
2. The Consequences of Injury to the Peripheral Nerves in Man. HEAD and SHERREN.
3. The Structure and Function of the Taste-Buds of the Larynx. WILSON.

1. *Afferent Nervous System*.—The authors have attempted to show that two essentially different phenomena of sensation are to be distinguished where only one had formerly been considered. Instead of a diminishing of sensibility when a nerve is divided what really happens is a loss of some kinds of sensibility while others are retained. Thus Dr. Head had the cutaneous branch of the radial in his own arm cut, and arranged a series of experiments comparing the sensibility of the arm before and after the operation. All forms of cutaneous sensibility, whether to cotton, pin prick, heat or compass points, were lost after the operation, but sensibility to dull objects or light touch was not impaired. This is important since light touch is so used to determine loss of sensibility. Sensibility to pin prick returned slowly after several weeks, but at the end of two years the arm was still imperfectly sensible to cotton and compass points. Furthermore, between the temperatures of 32° F. and 50° F. no difference could be detected, anything above 50° F. being appreciated as warm, and anything below 32° F. as cold. The author has confirmed this experiment by examination of a large number of peripheral nerve injuries, and reaches the conclusion that ordinary touch sensibility includes at least two types. One is a sensibility which is able to produce qualitative changes in consciousness, but is incapable of being estimated as far as its intensity is concerned apart from the area of surface stimulated, which is unable to distinguish the position of points in an area, and which causes a widespread reaction not infrequently referred to a distance. This form of sensibility he terms *protopathic*. After some time the injured member recovers gradually sensibility to light touch and to degrees in temperature, can discriminate the compass points again and localize accurately. To this form of sensibility the authors give the name *epicritic*. The sensory mechanism in the peripheral nerves is thus found to consist of three systems: (1) Deep sensibility, capable of answering to pressure and to the movement of parts, and even capable of producing pain under the influence of excessive pressure, or when the joint is injured. The fibers subserving this form of sensation run mostly with the motor nerves, and are not destroyed by division of all the sensory nerves to the skin. (2) Protopathic sensibility, capable of responding to painful cutaneous stimuli, and to the extremes of heat and cold. This is the great reflex, producing a rapid widely diffused response, unaccompanied by any definite appreciation of the locality of the spot stimulated. (3) Epicritic sensibility, by which we gain the power of cutaneous localization, of the discrimination of two points, and of the finer grades of temperature. The authors, therefore, put forward a new conception of the nature of the afferent fibers in peripheral nerves. The whole body, within and without, is supplied by the protopathic system. The fibers of this system in the skin may be spoken of as somatic, those to the internal organs as visceral protopathic fibers. Thus we shall no longer speak of the afferent sympathetic

system, but of the protopathic supply of the internal organs. Another set of afferent fibers peculiarly associated with impulses of movement and pressure exist in connection with the Pacinian organs. In the body and limbs an analogous system is found peculiarly susceptible to pressure, to the localization of movement, and to the appreciation of position. The fibers of this system run in conjunction with the motor nerves. In addition to these two systems which are distributed to all parts of the body, within and without, the surface of the body only is supplied by a third system which we have called epicritic. This endows the skin with sensibility to light touch. To the impulses conducted by this system we owe the power of localizing the position of cutaneous stimuli, of discerning the doubleness of two points and of discriminating between minor degrees of heat and cold, and other special attributes of sensation. The fibers of this system are more easily injured, and regenerate more slowly, than those of the protopathic system. They are evidently more highly developed, and approach more nearly to the motor fibers that supply voluntary muscle in the time required for their regeneration.

2. *Injuries to Peripheral Nerves*.—This is a very extensive and extended discussion of peripheral nerve injuries which cannot well be summarized in an abstract. The authors have divided this subject into sixteen chapters, discussing in great detail a large number of subjects. The various articles are founded on the study of a large number of individual nerve injuries. The general conclusions drawn from this study have already been given in the abstract of the first part of this series.

3. *Taste-Buds of the Larynx*.—Dr. Wilson gives a very interesting and instructive study of the structure and function of taste-buds of the larynx as determined by the intra-vitam methylene blue injection method. As little work had been done on the larynx it was decided to study these nerve endings. Taste-buds are found on the laryngeal surface of the epiglottis and the median and lateral surface of the arytenoids, being present only in the squamous epithelium, extending through the whole depth of the epithelium. Like the taste-buds of the tongue, the laryngeal taste-buds have two types of cells, the spindle-shaped cell and the supporting cell, also a flask-shaped cavity in its upper segment. The spindle-shaped cell extends the whole length of the bud; it is not confined to the axial region. Its central termination, long, fine and unbranched, reaches to the connective tissue of the papilla, but not into it. Peripherally its cytoplasm is prolonged into a very fine hair-like process, which projects into the cavity of the taste-bud, and may even reach to the taste pore. In vital staining with methylene blue, not only does the nucleus stain readily, but the facility with which the whole cell takes up the dye is in marked contrast to the non-reaction of the supporting cell and of the surrounding epithelial cells to the dye. In these cases the cell is very sharply outlined. The evidence in support of the special sense function of the fusiform cell is based on: (a) The fact that it colors readily with neurotropic dyes, as opposed to the non-colorability of the supporting cell. (b) The morphological character of the cell. Primary colorability as a test for a neuro-epithelial cell, though of great value, is subject to so many exceptions that alone it is open to objections. Methylene blue, although neurotropic, is not monotropic. It is impossible to deduce from primary colorability that we are dealing with a nerve termination. Some cells which so stain cannot be recognized as neural cells; for instance, one cell in the epithelium which readily takes up the dye is the so-called wandering cell, which has been mistaken for and described as a ganglion cell (Dogiel, 1903). In the bud, however, we have two varieties of cells, one of which, the spindle-shaped cell, shows the neurotropic character, the other does not; so we are justified in assuming that the former possesses a certain chemical constitution which allies it more closely to the nerve cell. When to this we can add such morphological characteristics as its peripheral process with relation to the pore, its analogy to other special sense cells, we have support for the

belief that the fusiform cell is specially engaged in the mediation of the sense of taste. The second type of cell, the so-called supporting cell, differs in no respect from the corresponding cells in the buds of the tongue. Its shape varies very greatly, but there are not two types in this cell, one peripheral and one central. The irregularity is due in some degree to fixation. The cells are loosely applied and adjusted to each other, to the taste cells and to the epithelium around, leaving spaces through which leucocytes may wander (Ranvier, 1888). Under fixation they readily shrink and may withdraw from each other, but chiefly as a bud from the epithelial wall from which they may separate at any point. When this shrinkage occurs, the intercellular bridges which pass from the epithelial wall to the supporting cells are easily observed, and without doubt distort the cell wall. While this is so, the general relation of the supporting cell to the taste cell and its general outline in cross section prove that we have to do with a cell which readily adjusts its contour to the adjoining parts. In the center of the bud it appears somewhat triangular, with the fusiform sensory cell applied to the flattened and slightly convex surface; at the periphery there is a similar adjustment of the external surface to the epithelial wall—convexity to concavity. Its general appearance and its mobility of surface suggest a cell protoplasm easily susceptible to external influences. With reference to their functions the authors believe that the hypothesis which assumes that these end organs act as sentinels to assist in the protection of the laryngeal cavity during the passage of food is the most likely one.

JELLIFFE.

Neurologisches Centralblatt

(Vol. 24, No. 11, June 1, 1905.)

1. Investigations on the Motor Localization of the Lower Extremity in the Spinal Cord of Man. C. PARHON and M. GOLDSTEIN.
2. The Psychology of Confabulation. A. PICK.

1. *Motor Localization in the Spinal Cord.*—The authors examined the spinal cords of two patients, on one of whom amputation was done for senile gangrene in the middle of the thigh of one limb, and several years after of the knee of the other leg, the patient dying some weeks after. In the other case, because of an osteomyelitis, an amputation was done in the middle of the thigh. The examination of the nerve cells of the spinal cord showed chromophylic changes beginning in the upper portion of the third lumbar segment, and also involving some of the nerve cells of the fourth and fifth segments. These results were compared with those attained by experimental work on the lower animals, and found to correspond with these and also with the work of other authors. The original should be read for details.

(Vol. 24, No. 12, June 16, 1905.)

1. The Return of the Knee Phenomenon in Tabes Dorsalis, Without the Occurrence of Hemiplegia. J. DONATH.
2. The Symptomatology of Delirium Tremens. M. REICHARDT.
3. The Motor Cell Groups in the Cervical Swelling of the Spinal Cord in Man, as a Result of Amputation Cases. L. BLUMENAU.

1. *Knee Jerk in Tabes Dorsalis.*—Donath records a typical case of tabes dorsalis in which twenty-two months after the onset of the typical symptoms, both the patellar and the Achilles jerk reappeared and later became exaggerated. There was apparently no involvement of the lateral columns. He compares this phenomenon with the occasional return of the light reflex in the same disease, and considers that as a result of treatment the reflex arc of these reflexes must have been little diseased and have regained function.

2. *Delirium Tremens.*—Reichardt, following Lippman's interesting experiments, found that by giving a clean sheet of paper to patients who had passed the active stage of delirium tremens these patients would sometimes

inspect all sides of the paper for hours and would describe objects they were seeing. These were not illustrations, but pure hallucinations. These patients would be able to read figures and sentences perfectly, arguing against the peripheral origin of the hallucinations.

3. *Motor Cell Groups in the Cervical Cord*.—Blumenau examined the spinal cord of a soldier who had an amputation of the upper third of one arm, and found the nerve cells of the postero-lateral part of the last four cervical and first thoracic segments diseased. These findings correspond with the experiments made on lower animals.

(Vol. 24, No. 13, July 1, 1905.)

1. Some Rare Forms of Multiple Sclerosis. E. MÜLLER.
2. Disturbances of the Sensibility of the Limbs in Tabes Dorsalis. R. FRIEDLANDER.
3. New Method of Staining the Nerve Cells. W. PASSEK.

1. *Multiple Sclerosis*.—Müller believes that the temporal paling of the discs is the most certain sign of this disease. He describes three rare forms of onset. In the first, there is a sudden loss of vision, either in both eyes or in one after the other, with remission of symptoms. The ophthalmoscope shows temporal paling of the optic discs, with normal form fields and no scotoma. Besides, he considers as an early symptom absence of the abdominal reflex, some inco-ordination of the arms and a Babinski sign. He does not argue with Oppenheim that the abdominal reflex is uncertain, for in an examination of 1,000 soldiers this sign was absent only once. In the second, the disease comes on with a general tired feeling in any limb, but examination will show the above mentioned symptom. In the third, the disease may be ushered in by neuralgic or lancinating pains, either in a sensory distribution or in the limbs.

2. *Tabes Dorsalis*.—The author, in an examination of twenty-seven tabetics, found the first sensory symptom to be that of loss of sense of position, and this was more marked in the distal part of the extremity, and became less proximally. The loss of sense of position was commensurate with the ataxia.

3. *Staining Nerve Cells*.—Continued article.

(Vol. 24, No. 13, July 16, 1905.)

1. Concerning Dementia Paralytica After Injury. G. RHEINHOLD.
2. New Method of Staining Nerve Cells. W. PASSEK.
1. *Dementia Paralytica*.—The traumatic cause of dementia paralytica is not admitted by many. Rheinhold records an interesting case of a man of forty, without alcoholic or specific history, who developed paralytic dementia seventeen months after an injury to the head. The pathological examination showed arterio-sclerotic changes and areas of softening throughout the brain.
2. *Staining Nerve Cells*.—This article is not suited for abstracting.

(Vol. 24, No. 15, Aug. 1, 1905.)

1. With Which Part of the Brain Does Man Think? A. ADAMKIEWITZ.
2. Asthenia Paroxysmalis. M. BORMSTEIN.
3. The Development of Neuro-Fibrils. H. HELD.
1. *Brain Localization*.—Adamkiewicz again advances his well-known views that the function of thinking is performed by all of the cells of the brain cortex. He divides this function into the active and inactive forms. The former is concerned with active thought, the latter he explains or exemplifies by the function of the process of dreams. Special functions, such as seeing, hearing, etc., are, of course, referred to the special centers or the occipital and temporal lobes.
2. *Asthenia Paroxysmalis*.—Continued article.
3. *Neuro-Fibrils*.—Not suited for abstracting.

(Vol. 24, No. 16, Aug. 16, 1905.)

1. The Clinical Interpretation of Confabulation. C. NEISSER.
2. Further Contribution to the Nature of the So-Called Supraorbital Reflex. C. HUDOVERNIG.
3. Asthenia Paroxysmalis. M. BORNSTEIN.

1. *Confabulation*.—In a short article the author publishes a case record to show that falsification of memory is not an unusual symptom of confabulation.

2. *Supraorbital Reflex*.—Hudovernig again revives the old controversy on the supraorbital reflex, and now believes that it is not a true reflex, but a mechanical phenomenon.

3. *Asthenia Paroxysmalis*.—Bornstein reports a very interesting case of a man of fifty-six who, for five years, has complained of periodic weakness of the upper and lower limbs, these attacks lasting about twelve hours, principally occurring at night. Besides there were vasomotor symptoms, as shown by the dryness of the secretions; no disturbances of sensation, slowness of intellect, lowering of the sp. gr. of the urine, a peculiar condition of the blood, and a diminution of faradic excitability. The symptom complex above described resembles most closely the familiar paroxysmal paralysis of Goldflam. The author considers, however, that his case is different from those described by Goldflam, and explains the symptom complex by an affection of the vasomotor center.

(Vol. 24, No. 17, Sept. 1, 1905.)

1. Pseudomelia Parasthetica as a Symptom of Cerebral Affection in the Region of the Lenticular Nucleus. BECHTEREW.
2. The Influence on Menstruation Through Cerebral Focal Disease. MÜLLER.

1. *Pseudomelia Paresthetica*.—Bechterew records a very interesting case in which, through a focal lesion in the right lenticular nucleus, there were present at first convulsions and then paralysis of the left half of the body. There was no disturbance of sensation, but there was loss of muscle sense and considerable atrophy. A curious symptom, to which Bechterew gives the name of pseudomelia paresthetica, was present, which consists in the patient having a false impression that the limb was being moved, although it was at rest.

2. *Menstrual Disturbances in Cerebral Disease*.—Axenfeld, in 1903, first called attention to the disturbances of menstruation occurring in cerebral disease. Bayerthal further wrote upon the subject. Müller, in this paper, records five cases of brain tumor, situated mostly in the posterior cranial fossa, in which amenorrhea was one of the earliest symptoms. He inclines to the view that any tumor involving the pituitary body or the neighboring regions or any tumor of any portion of the brain in which there is an early and large hydrocephalus with rapid diminution of vision may have menstrual disturbances as its earliest symptom. After discussing various theories on this subject, he inclines to the view that the hypophysis may have some influence upon menstrual functions.

(Vol. 24, No. 18, Sept. 16, 1906.)

1. A Painful Point of An Unusual Kind. A. FÜCHS.
2. Contribution to the Pathology of Raynaud's Disease or Symmetrical Gangrene. J. M. BELBOWSKY.
3. Polyneuritis Cerebralis Meniereiformis. A. BERGER.

1. *A Painful Point*.—A man of forty-eight for six years had an intensely painful spot on the front of his chest, which caused agonizing pains by the slightest touch or movement. This was removed, and by microscopic examination it was found to be a gland without an exit point, of an epithelial structure. It is unexplained how such a gland could be found in the skin.

2. *Raynaud's Disease*.—The author records a very well studied case of Raynaud's disease. The findings in brief consist of a diffuse atrophy of nerve fibers throughout the whole spinal cord, an arteriosclerotic condition of the blood vessels, and what he considers an annual degeneration of the white matter throughout the whole cord. The peripheral nerves and roots were also diseased. No interpretation is attempted.

3. *Polyneuritis Cerebralis Meniereiformis*.—Berger calls attention to the symptom complex first described under the above name by Frankl-Hochwart. He gives a brief abstract of all the previously recorded cases, five in number, and adds one of his own. In brief, the symptoms come on acutely with fever, and in all the cases there was an involvement of the facial, acusticus and the sensory portion of the trigeminus. Besides, there were roaring in the ears, deafness, vertigo and some gastric disturbances. The polyneuritic involvement is always unilateral.

(Vol. 24, No. 19, Oct. 1, 1905.)

1. A Contribution to Acute Heart Dilatation. KRESS.
2. Remarks on Asthenia Paroxysmalis of Dr. Bornstein. WESTPHAL.
3. Anatomic-Clinical Contribution to the Study of Cerebral Sensory Disturbances. SCHAFFER.

1. *Heart Dilatation*.—Should be consulted in original.

2. *Asthenia Paroxysmalis*.—A. Westphal calls attention to the fact that his father, C. Westphal, together with Oppenheim, first described the familiar paroxysmal paralysis attributed to Goldflam.

2. *Cerebral Sensory Disturbances*.—In an excellent paper, Schaffer discusses the clinical varieties of cerebral anesthesia and then discusses their pathological and anatomical foundation. Besides the well known forms of anesthesia he describes a new form, a total anesthesia which occurs in diplegia, due to bilateral cortical lesion. He details such a case. He believes that in sub-cortical lesions topoanesthesia, or a form of sensation in which the patient refers sensation to a distant part, may be found, and is quite characteristic of lesions in this area. He agrees with Dejerine and Long, and also with the investigations of Probst, regarding the anatomical distribution of the sensory fibers. He believes, however, that a limited lesion of the internal capsule may cause a persisting hemianesthesia, having reported such a case in which a lesion was found in the anterior part of the internal capsule, assuming that the sensory and motor fibers are not separate in the capsule. A lesion of the posterior part of the capsule will only cause partial disturbance of sensation, for to have complete hemianesthesia the ventrolateral part of the thalamus must be destroyed. A lesion involving the fibers coming to the ventro-lateral nucleus of the thalamus, or of the fibers issuing from the nucleus would also cause permanent hemianesthesia. Either a subcortical lesion or a cortical lesion, which destroyed all of the sensory motor fibers, would, of course, cause permanent hemianesthesia.

(Vol. 26, No. 20, Oct. 16, 1905.)

1. A Contribution to the Pathogenesis of Nevus Vascularis. NÄCKE.
2. The Course of Pyramidal Fibers in the Posterior Columns of Man. BUNCKE.

1. *Nevus Vascularis*.—Näcke discusses the various theories of the causation of nevus, and believes that they are of teratological origin.

2. *The Pyramidal Bundles*.—Buncke details two cases of hemiplegia in which, by the method of Marchi, some degenerated fibers were found in the posterior columns. He considers these as part of the pyramidal bundles. (The cases are by no means clear.)

(Vol. 24, No. 21, Nov. 1, 1905.)

1. Alterations of Muscle Sensibility in Tabes and Other Pathological Conditions, and Concerning the Myosthesiometer. V. BECHTEREW.

2. Sudden Deaths in Tabes. GOLDFLAM.
3. Two Cases of Singultus Crisis in Tabes. STEMBO.
4. Tabes in the Young Person. LASAREW.
5. The Course of Pyramidal Fibers in the Posterior Columns of Man. BUNCKE.

1. *Muscle Sensibility*.—Bechterew considers that disturbance of pressure sense is a constant symptom of early tabes, and that this may be present before evidences of disturbance of sensation.

2. *Death in Tabes*.—Tabes as a rule does not shorten a man's life. Sudden deaths may be due to any cause, principally apoplexy (brain), angina pectoris and aortic aneurysm.

3. *Singultus Crisis in Tabes*.—The author details such a case.

4. *Juvenile Tabes*.—Continued article.

5. *The Pyramidal Bundles*.—Continuation from previous number.

(Vol. 24, No. 22, Nov. 16, 1905.)

1. The Width of the Cortex as a Causal Factor in the Question of the Development of the Brain and the Intelligence. KAES.
2. Tabes in the Young Person. LASAREW.

1. *Width of the Cortex*.—This is a very able article, but not suited to abstracting.

2. *Juvenile Tabes*.—The author has carefully considered all the cases of juvenile tabes reported in the literature, and has rejected all but twenty-three. He adds a case of his own. The diagnosis is often very difficult from Friedreich's disease, cerebrospinal meningitis (syphilitic), and from postero-lateral sclerosis (Oppenheim's case).

(Vol. 24, No. 23, Dec. 1, 1905.)

1. Concerning the Origin of Hallucinations and Illusions. JENDRASSIK.
2. The Bladder Disturbances of Hemiplegia. MÜLLER.
3. Posthemiplegic Movements. FREY.

1. *Hallucinations and Illusions*.—Not abstracted.

2. *Bladder Disturbances*.—Müller has for some years studied cases of hemiplegia for bladder disturbances, and found that in the majority of cases of hemiplegia and of pyramidal disease some disturbances of urination may be present. He does not explain the probable cause.

3. *Post Hemiplegic Movements*.—The author reviews the well-known theories of the causation of such movements, and agrees with von Monakow that they are probably due to a lesion of the optic thalamus in the hypothalamic region, and he also believes that the thalamus is a co-ordinating center.

(Vol. 24, No. 24, Dec. 16, 1905.)

1. The Secondary Degenerations Following Injury of the First Cervical Root in Man. BUNCKE.
2. The "Streck Phenomenon." SAXL.
3. Autogenous Regeneration of Nerve Fibers. LUGARO.

1. *Injury of First Cervical Root*.—In a case of pontile tumor, the right posterior cervical root of the first segment, was found degenerated. No fibers were found degenerated below this segment. The degeneration was traced upward to the caudate nucleus, and was found to be posterior to the trigeminal fibers, confirming van Gahuchten's experiments.

2. *"Streck Phenomenon"*.—Not abstracted.

3. *Nerve Regeneration*.—Lugaro was provoked into discussing regeneration of the sciatic nerve in a case in which Raimann cut the spinal supply, but failed to cut the supply from the obturator and cruralis. Lugario, while not as yet ready to publish his experiments, quotes how he had never found regeneration in cases in which the spinal ganglia, cord and possibly other nerves which may assist in anastomosis had been cut.

WEISENBURG (Philadelphia).

THE
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Original Articles

**MULTIPLE SCLEROSIS: A CONTRIBUTION TO ITS CLINICAL
COURSE AND PATHOLOGICAL ANATOMY.***

BY E. W. TAYLOR, M.D.,
OF BOSTON.

It remains a certain reproach to American neurology that so little attention has been paid to the disease, multiple sclerosis. The plea that it is a very rare affection in this country is not likely to stand the test of further experience. Although the disease has excited the greatest possible interest, both on the clinical and pathological side, in Europe since its first description by Cruveilhier in 1835, the contributions in this country remain extremely meagre. The list with autopsy is as follows:

The first cases were described by Seguin¹ in 1878 under the title, "A Contribution to the Pathological Anatomy of Disseminated Cerebrospinal Sclerosis." These cases have been curiously overlooked as recently pointed out by Mills; they are admirably reported, and quite apart from the descriptive text, the illustrations leave no doubt of the diagnosis. The third case was reported by Mills² the following year, which likewise has been overlooked, probably due to the fact that it was published in a journal which had a short life and is now little known.

Many years elapsed before the subject again received attention in this country. In 1892 Dana, in the first edition of his

*Read in part at the meeting of the American Neurological Association, June, 1905.

¹Seguin: JOUR. NERV. AND MENT. DIS., V., 281, 1878.

²Mills: Hospital Gaz., N. Y., Nov. 22, 29, 1879. Reference has recently been made to these cases by Mills at a meeting of the Philadelphia Neurological Society, and reported in the JOUR. NERV. AND MENT. DIS., xxxii., 185-187, 1905.

Text-book of Nervous Diseases, alludes to the rarity of the disease in America and speaks of but two cases verified by autopsy, presumably those of Seguin. Since then the following cases have been reported and verified post-mortem: Burr and McCarthy,³ one; Hunt,⁴ one; Spiller,⁵ three; Spiller and Camp,⁶ two; Dercum and Gordon,⁷ one. Webber⁸ has likewise put on record two cases, but somewhat incompletely reported from the pathological side. To these I am able to add nine cases with autopsy, three of which, however, were published in Germany and studied there, so that they cannot properly, as Spiller has pointed out, be regarded as American cases. Of the remaining six, one was observed during life by Dr. James J. Putnam, a second by Drs. Putnam and G. A. Waterman, and the others by myself. The fifth case I saw some years ago and failed to make a diagnosis. The patient has since died, and the post-mortem examination revealed typical multiple sclerosis. The clinical history given is my own, but for the statement of the result of the autopsy I am indebted to Drs. F. H. Baker and T. A. Hoch, of Worcester, who propose to publish the case later in full. It is interesting to note in passing that of these six cases but two correct diagnoses were positively made during life.

Many papers of much importance have been written on the subject during the past few years. In 1898 Sachs⁹ made a critical review of our knowledge of the disease which is valuable not only as an epitome of work previously done, but also as an expression of personal opinion. Hoffmann¹⁰ in 1902 published a report of one hundred cases with three autopsies observed at the Heidelberg clinic, and likewise gives a general résumé of the subject. In 1904 Borst,¹¹ on a basis of four hundred and eighty-four references, again gives a critical discussion of the subject; and also in 1904 the most comprehensive monograph which has

³Burr and McCarthy: *JOUR. NERV. AND MENT. DIS.*, xxvii., 634, 1900.

⁴Hunt: *Am. Jour. Med. Sc.*, cxxvi., 974, 1903.

⁵Spiller: *Am. Jour. Med. Sc.*, cxxv., 61, 1903. Also case after malaria. Cont. from Wm. Pepper Laboratory of Clin. Med., 1901.

⁶Spiller and Camp: *JOUR. NERV. AND MENT. DIS.*, xxxi., 433, 1904.

⁷Dercum and Gordon: *Am. Jour. Med. Sc.*, cxxix., 253, 1905.

⁸Webber: *JOUR. NERV. AND MENT. DIS.*, xxxii., 177, 1905.

⁹Sachs: *JOUR. NERV. AND MENT. DIS.*, xxv., 314, 1898.

¹⁰Hoffmann: *Deutsch. Zeitsch. f. Nervenheilk*, xxi., 1, 1902.

¹¹Borst: *Ergb. d. Allg. Path. u. Path. Anat*, ix, 67, 1904.

yet appeared was published by Müller¹² from studies made at Strümpell's clinic. Müller investigated the literature with greater care than any of his predecessors, with the result that he was able to collect 1,148 references. This monograph, comprising eighty new cases and six autopsies, not only enters upon the minutest historical detail, but also discusses the literature of the subject in the most comprehensive possible manner.

Evidence of the extraordinary interest which the disease is exciting abroad is shown by the fact that during the years 1904 and 1905, eighty references have been added to the 1,148 quoted by Müller. These are appended to this article.

CASE REPORTS.

Case I. F. N. D., factory employee, unmarried, nineteen years of age, was seen by Dr. James J. Putnam in consultation Nov. 6, 1891. He has very kindly allowed me to use the following notes of the case:

One year previously the patient noticed lameness and a feeling of numbness in the right leg. She remained at home four weeks, grew better, and returned to work. The following February she had numbness of the right hand associated with uncertainty of motion. The leg also was dragged in walking and was incoördinate, but not markedly weak. A similar disturbance began in the left side, but improved. Thereafter, for a time, there was general improvement, except for irritability and general nervousness. Within a few months there was a return of symptoms with poor sleep. The muscles of the face were slightly affected; face felt numb; articulation was somewhat disturbed, as was vision also at times. The left side of the face was alone affected, whereas the right arm and leg were especially involved. She had likewise transient vertigo and diplopia. Pain in the legs and a sense of soreness about the hip and knee and back part of the thigh developed. In April, 1892, there was some difficulty in swallowing, which, like many of the other symptoms, came and went. Headache developed, lasting for a day or two at a time. Previous to the onset of the illness her health had been good and she had had no marked nervous symptoms, excepting rather disturbed sleep. Family history was unimportant.

Physical examination showed an uncertain gait, with a tendency to drag the left foot. There was static and locomotive ataxia of the hand. Knee jerks were increased; there was ankle clonus at times; plantar reflex absent. Sensation of the feet was somewhat disturbed. In the left foot there was slight disturbance of temperature sense and sense of position. Contact sense was diminished. In the right foot also there was slight impairment of sense of position, but touch was better felt than on the left. Temperature sense was also disordered on the left. The eye grounds were normal; the heart showed no abnormality; micturition was not disturbed; the urine showed nothing abnormal, except increased acidity, and no lead or arsenic was found.

In December the patient appeared to improve. Early in the following year there was some change in cutaneous sensibility; ankle clonus was easily excited; the right knee jerk was greater than the left. Improvement

¹²Müller: Die Multiple Sklerose des Gehirns und Rückenmarks, pp. viii.—394, Jena, 1904.

again took place. Headache had persisted for about a year and vertigo was now added. Walking was difficult, but could be accomplished without a cane. Some months later there was a rapid change for the worse; the left leg felt numb, although the sensation to objective tests was not impaired; the disturbances were more marked on the right leg, and a type of crossed paralysis developed. Owing to the difficulty in locomotion, due to the spasticity, she was seen by Dr. C. L. Scudder with reference to apparatus. It then appeared that she had had somnambulistic attacks throughout her life. During one of these attacks, although she was then unable to walk, and was in fact confined to her bed, she was found at the door of her room, apparently having walked there in her somnambulistic state. She was, however, unable to walk back to her bed. Hysteria was suggested by this event, although Dr. Putnam did not share in that opinion. Hypnotism was attempted, but the results were without significance. In October, 1894, she was able to walk a very little, apparently due to a feeling of encouragement regarding her condition. She was cheerful and her appetite and sleep were good. She was able, with much difficulty, to go down stairs unaided, but her arms improved less than her legs. According to her mother, her eyes had seemed well for the past two years. She died shortly after, having at no time had typical intention tremor, nor nystagmus, nor speech defect.

The diagnoses suggested by the case were ataxic paraplegia, neuritis (pseudo-tabes) and hysteria, although this latter was not entertained by Dr. Putnam.

Autopsy. Details of the gross appearances at the post-mortem examination are lacking. Microscopic examination of the central nervous system showed extensive lesions, predominantly of the spinal cord, but not limited to it.

Spinal Cord. Throughout the cord there were numerous somewhat diffuse areas of degeneration, often involving the greater part of the cross section and affecting gray and white matter indiscriminately. In the sacro-lumbar region degenerated areas were widespread, in the upper lumbar region involving practically the entire cross section. In the thoracic segments the lesions were also extensive, with much involvement of the gray matter. In the cervical region the diffusion of the process was still wider, and here likewise at one level practically totally transverse. The spinal nerve roots showed somewhat doubtful degeneration, but not of marked degree. The peripheral nerves studied, the sciatic and the ulnar, showed no abnormality. The oblongata, pons and cerebral hemispheres, so far as studied, showed few lesions. Although the examination of the brain was not sufficiently complete to justify dogmatism on this point, it is safe to assume that the lesions of the spinal cord were proportionately far more extensive than those of the brain stem or hemispheres.

Histological examination of sclerotic patches showed the usual degeneration of myeline and proliferation of neuroglia with predominance of fibres often of fine calibre and wavy arrangement. Except for some distortion of nuclei and excess of pigment, there were no noticeable nerve cell changes. The nuclei were not dislocated, nor was there alteration of shape to be otherwise interpreted than probably artefact. The blood vessels showed no significant pathological change, nor was it possible to bring them into relation with sclerotic areas.

This case derives special interest from the facts that the

symptoms during life were wholly atypical, and, although the patient was carefully studied, did not permit of a correct diagnosis at most competent hands. The predominance of sensory symptoms, both subjective and objective, is worthy of note, as is the absence of what are popularly termed the cardinal signs. Post-mortem the lesions were found to be confined largely, though not wholly, to the cord, adequately explaining the absence of nystagmus and speech defect, but not explaining the failure at any time of characteristic tremor. A positive diagnosis during life of such a case is a practical impossibility.

Case II. M. M., forty-two, unmarried. This patient was also seen by Dr. James J. Putnam in consultation with Dr. M. V. Pierce, of Milton, and I am again indebted to Dr. Putnam for the use of his notes.

A year and a half before she was seen by Dr. Putnam, which was in October, 1897, she had grown sensitive to noises, had become emotional, and had noted twitchings of the limbs. She slept poorly; there had been marked failure in her speech, so that she was able to enunciate slowly and with effort only. At times she could scarcely be understood. She, however, improved considerably. For six or eight weeks before seeing Dr. Putnam she had severe headache, and what she described as a numb feeling in the head, associated with staggering and more violent headaches than heretofore. She had noted also an occasional numbness of the right hand. She was unable, for example, to pick up a needle. She felt drowsy and dull. Examination showed paresis of the right seventh nerve, impairment of articulation of the slurring type, and a restricted vocabulary, but without true aphasia. There was slight static and locomotive ataxia of the hand, slight Romberg and paresis of the left sixth nerve developed. The knee jerks were markedly increased; there was twitching of the globes on fixation toward the left; no optic neuritis; sensibility of the skin was more acute on the right than on the left, although pricking was felt more sharply on the left side, and various slight disorders of sensibility were noted on both sides. The symptoms were on the whole progressive with an increase of paralysis up to the time of her death.

Dr. Putnam's opinion is expressed in the following letter to Dr. Pierce:

"I have no doubt that M. M. has a serious cerebral affection of the general nature of new growth. I do not find any optic neuritis at present, but the increasing headache makes it probable that there is something there which causes pressure. The signs are bilateral as regards the limbs, but the right side of the face is paretic, and the left abducens oculi. Both knee jerks seem to be increased. Those signs, taken in conjunction with a very considerable ataxia, must, I think, indicate diffuse cerebrospinal disease such as a somewhat unusual form of disseminated sclerosis or else a localized affection of the cerebellum and medulla. A cerebellar tumor will explain the whole fairly well, assuming that it compresses the pons and medulla, but on the other hand, cerebellar tumors usually cause optic neuritis very early. I suppose there is no outlook for specific disease. I would suggest trying the effect of potassium iodide in increasing and eventually large doses."

Autopsy. Autopsy by Dr. G. A. Waterman, to whom I am also indebted for cutting the sections. Owing to the fact that the nature of the disease was

not suspected, the brain was alone removed and the brain stem studied microscopically. The oblongata, pons and quadrigeminal region all showed typical lesions with well-defined borders. In the lower oblongata a sclerotic patch involved the olive, and another, much smaller, the region of the dorsal horn of the opposite side. At a higher level a large sclerotic area occupied again the region of the olive and extended beyond into the substance of the bulb. In the quadrigeminal region the lesions were multiple, though, so far as studied, smaller in individual extent. One of these lesions showed in a remarkable way a method of the development of a sclerotic patch. In the centre of this lesion the myeline sheaths had absolutely disappeared; surrounding this highly degenerated area was a border in which the degeneration of myeline sheaths had begun, although many were still intact and practically normal in appearance. This less degenerated area was separated from the more degenerated central portion by a sharp line of demarcation. Outside of this partially degenerated area there was a quick transition to the normal. This appearance is more fully discussed later.

The blood vessels in the various lesions studied in this case showed absolutely no relation to the areas of degeneration, nor did the blood vessel walls show any alteration in the sclerotic areas as contrasted with normal areas.

The condition of the spinal cord is naturally not known, nor is there a record of the degree of degeneration in the brain. There is, however, absolutely no doubt from the character of the lesions studied that the case was one of multiple sclerosis.

In this case likewise sensory symptoms are conspicuous. Although there was a suggestion of multiple sclerosis in the disturbance of articulation, and in the doubtful nystagmus, the failure of typical tremor and the difficulty in the interpretation of the other conspicuous symptoms rendered a positive diagnosis impossible. Dr. Putnam's letter to Dr. Pierce shows the suspicion he entertained regarding the diagnosis and also illustrates the impossibility of assurance with the symptoms as presented during life. Unfortunately the study of the entire nervous system was not possible in this case, but the very extensive lesions of the pons and oblongata account for the suggestion of tumor in the posterior fossa, a diagnosis which Dr. Putnam entertained.

Case III. E. H., forty-six years old, married, was admitted to the Long Island Hospital July 29, 1901. Three years before entrance to the hospital she had an attack of rheumatism, associated with considerable fever and pain, localized more particularly in the left foot. She recovered from this, and was well, as she thought, up to five months before entrance. She then had another acute attack of rheumatism; entered the Boston City Hospital, and later on the Massachusetts General Hospital. Her foot and ankle were swollen and painful, but no other joints were affected. On entrance she complained of shortness of breath and some vertigo.

Physical examination at this time gave the following results: Pupils equal and of normal reaction; tongue, protruded straight, clean and moist; no facial paralysis; heart and lungs normal; abdomen normal; liver not

enlarged; knee jerks increased, with ankle clonus on the right and Babinski on both sides; arm reflexes were active; the left leg was held stiff at the knee, could be bent actively, but passive motion was resisted; sensibility showed a certain blunting of its various qualities; the hand grasp was weak.

Beyond a somewhat weak and spastic gait the patient presented in the following months little that was noteworthy. The legs showed some edema, but the patient was able to be up and about the ward; her appetite and sleep were satisfactory.

Sept. 10, 1902, it was noted that she occasionally had nausea and vomiting, but this was not a marked or disturbing symptom; walking was difficult. In October she walked but little; her right ankle was weak and tended to bend outward; she had some numbness in the right foot and leg, and some transient weakness of the right hand; she also complained of frequent headaches and hot flushes; was worried; had pain in the back; had not menstruated for five or six months; appetite and sleep remained good.

Later it was noted that her temper had changed for the worse; that she was inclined to be impudent and disagreeable to the nurses, and refused to do certain work which she had previously been willing to do. When removed to another part of the institution she was practically carried, because of her refusal to walk, although she appeared able to do so. She was discharged from the hospital Dec. 11, 1902, and was readmitted Sept. 1, 1904.

Examination Sept. 1, 1904, showed that she had not been well in the interim, and had had much pain, particularly in her back, which had grown worse; she had a constant sense of heat and thirst also a feeling of great weakness; she had slight dyspnea, but no cough, and no vomiting. Menopause had occurred about one year previously. She was incontinent at night.

Physical examination showed that she was well developed and somewhat obese; right pupil was slightly larger than left; both reacted to light and on accommodation; chest showed nothing abnormal beyond rapidity of heart action and an increased aortic second sound. The abdomen was negative; the legs were swollen; knee jerks present and lively; Babinski on both sides; no ankle clonus; on the outer side of the right forearm was a reddened area which appeared warmer than the surrounding skin; on the back were several areas where the skin was broken. Urine showed a specific gravity of 1010; acid reaction, without albumin or sugar.

Sept. 10, a bronchitis and fibrinous pneumonia were noted, with the white blood corpuscles reaching 10,400. She thereafter improved; had no pain. On Oct. 25, tendency to bed-sores was marked; when patient lay on her back legs were flexed, and adduction was nearly impossible; there was also much pain in the back and legs; when lying on the side she could not extend her legs, and they tended to slowly contract when extended; there was much muscular spasm; knee jerks were at this time stated to have been normal, the decrease probably due to contracture; there was double Babinski; no clonus; sensation was reported normal, with normal muscular sensibility; the wrist and elbow jerks were normal; hand grasps equal; pupils reacted to light slowly; there was marked incontinence of urine and feces, and edema of the legs and feet; she was much depressed in mind and complained continually of her condition. On Oct. 27, it was noted that the patient was unable to distinguish between the head and point of a pin in certain areas.

Examination Nov. 11 by Dr. George A. Waterman: Patient unable to say how long she had been in the hospital, although her memory in general appeared good; tension in the arteries was apparently not high; grip of both hands was fair, but no reflex was obtained at the wrist; she complained of severe pain on moving the legs; there was ankle clonus on right, Babinski on both sides; legs contracted to nearly 90 degrees; superficial sensation good; no localized tenderness over spine; slight degree of arteriosclerosis; walls of arteries barely palpable.

Dec. 19, patient reported gradually to be losing ground; bed-sores were spreading. Later she became semi-delirious, with a general failure in strength, and died Dec. 31, 1904.

Autopsy No. 05:3 (762). By Dr. G. B. Magrath, Jan. 7, 1905, 175 hours post-mortem.

Anatomical Diagnosis: Decubitus (multiple), contractures of the lower extremities, edema of the legs, chronic adhesive pleuritis, pigmentation atrophy of the myocardium, dilatation of the left ventricle, emphysema of the lungs, broncho-pneumonia, fatty infiltration of the liver, kidneys; arteriosclerosis, multiple degenerations of the spinal cord and brain, edema of the brain.

Body. That of a woman forty-nine years of age; length approximately 145 cm.; fairly well developed and nourished; rigor mortis absent; post-mortem lividity of dependent parts; right pupil 0.5, left 0.6 cm. in diameter; marked edema of the ankles and lower legs; the legs are flexed upon the thighs at an angle of 90 degrees; extension impossible; flexion of about 15 degrees; the right thigh is abducted, the left adducted. The inner aspect of the right knee presents a loss of substance 3.5 cm. in diameter. The intergluteal fold at about the middle portion shows an ulcer 7 cm. in length by 3 in breadth, beneath which is a cavity, the base of which above is the sacrum and below necrotic tissue; this ulcer is continuous with a cavity about 3 cm. in depth, extending laterally beneath the edges of the ulcer for a considerable distance. The outer aspect of the right buttock presents an ulcer 3 cm. in diameter, also continuous with a cavity 4-5 cm. in depth, the boundaries of which are greenish, necrotic and foul-smelling; there is much undermining of the edges; below this is an incised wound with rounded edges, open, 3x1 cm., continuous by means of this sinus, with the cavity above described; on the floor of this sinus is denuded bone.

Upon section, subcutaneous fat 0.5 cm. in thickness; muscles thin and fatty infiltrated; omental and mesenteric fat fairly abundant; vermiform appendix and mesenteric lymph nodes negative.

Thorax: Height of diaphragm 4th rib on right side, 5th interspace on left.

Pleural Cavities: Left, interrupted by fibrous adhesions behind; right, normal.

Pericardial Cavity: Normal.

Heart: Weight, 260 gms.; epicardial fat abundant; upon section, cavities of the right side contain red clot, those of the left a moderate amount of semi-fluid dark red blood; myocardium pale yellowish brown and flabby. Wall of left ventricle 1, of right 0.3 cm. in thickness. Mitral valve 10.5, aortic valve 6.5, pulmonary valve 7, tricuspid valve 11.5 cm. in circumference. Depth of left ventricle 9.5 cm. Valves normal; cavity of the left ventricle slightly dilated. Coronary arteries show a little sclerosis without calcification.

Lungs: Left, rather voluminous; moderate anthracosis; generally gray red; slight puckered scar at the apex; of downy consistence throughout;

upon section; gray red and moist. Right, voluminous; the front gray, the back bluish red; pleura smooth; very small puckered scar at the apex; the lower lobe of slightly increased consistence, the upper downy, uneven and faintly nodular; upon section, this lobe in general dark gray red and rather moist; scattered over the surface are occasional areas round or oval, slightly elevated, finely granular and gray, under pressure yielding considerable bloody, frothy fluid, and an occasional mucopurulent plug.

Abdomen: Peritoneal cavity normal.

Spleen: Weight 140 gms.; capsule smooth; markings visible; consistence lax from post-mortem softening.

Gastro-Intestinal Tract: Negative.

Pancreas: Normal.

Liver: Weight 1390 gms.; surface in general smooth, that of the upper lobe bears an attached fibrous tag; general color mottled yellowish brown; upon section, lobules of very marked prominence, the centers brown red and slightly depressed, the borders pale yellow brown and slightly elevated; consistence friable; surface of section somewhat oily.

Gall Bladder: Normal.

Kidneys: Weight of both 215 gms.; capsule strips easily from a smooth surface; general color pale brown; upon section, cortex 0.5 cm. in thickness; pyramids bluish red; glomeruli faintly visible; pelvic fat somewhat increased; consistence normal.

Bladder: Distended; the inner surface smooth; otherwise negative.

Genitalia: Show a moderate degree of senile atrophy; otherwise negative.

Aorta: Shows a slight degree of diffuse sclerosis in the lower abdominal segment.

Cranium: Sinuses and dura normal.

Brain: Weight 1250 gms.; arteries of the base normal; moderate edema of the pia arachnoid; upon section, the left hemisphere near the mesial surface and about midway between the front and the vertex shows a region in the white matter about 1.5 cm. in diameter, oval, within which the brain substance is transparent, gelatinous and of a pale grayish color; the level of this region is slightly below that of the general cut surface; another similar region, smaller in size, is present in the lenticular nucleus of the left side, the area here about 5x8 mm.; otherwise negative. (Organ preserved in 10 per cent. formalin for further examination.)

Spinal Cord: Membranes normal; on serial section at intervals of 1 cm., in the cervical region there are present, chiefly in the middle and lower portions, areas upon the cut surface, depressed, grayish, transparent and more or less gelatinous; above chiefly of the right lateral column, the lower centrally and to the left, and below the cervical enlargement occupying wholly the left lateral column; in the mid-thoracic region similar depressions are present in the posterior column, here forming a wedge-shaped sector; the lumbar enlargement shows sparse patches (?) of the same sort.

Microscopic Examination: An examination in this case of the central nervous system showed macroscopic lesions only in the upper thoracic and cervical regions of the cord, and but one lesion of considerable size in the brain, as already described. Other areas of sclerosis were insignificant in size and number throughout the brain stem and hemispheres. Microscopic examination of the cord gave the following results: A section from the thoracic region showed no sclerotic patch, general thickening of the outer neuroglia layer with unaltered pia, thickening of the vessel walls

with the appearance of hyaline, nerve roots normal, possibly slight degeneration of myeline fibres at lateral periphery of the section. Various other levels in the thoracic and cervical region show typical sclerotic areas in various parts of the cross section, dorsal, lateral and central, not sparing the gray matter. At one level a patch reaching to the periphery shows along its border distinct thickening of the pia, but without cellular infiltration. Blood vessels are the same within and without the sclerotic areas. Nerve roots, whether or not in relation to sclerotic patches, normal. Nerve cells in general show normal markings with central position of the nucleus. There is no indication whatever of the diffuse combined type of cord degeneration. The main area found in the brain is about 1 cm. in diameter, lying in the white matter, with sharp delimitation of its edges. A very slight lesion in the immediate neighborhood of this larger one shows a beginning destruction of myeline. Vessels do not show the same degree of alteration as in the cord, nor do the vessels, either here or in the cord, show any relation whatever to the sclerotic areas. In general, the patches met with in this case are of the sharply circumscribed type.

No suspicion was entertained during life that this patient had multiple sclerosis, although repeated examinations were made. She was forty-six years old and presented none of the so-called cardinal symptoms of the disease, whereas the symptom-complex apparently left small doubt that she was suffering from a cord lesion of the nature of a diffuse myelitis or a diffuse combined degeneration of the Putnam-Dana type. In a measure the post-mortem examination justified this diagnosis inasmuch as the lesions were somewhat sharply limited to the upper portion of the cord and were not sufficiently extensive in the brain to produce symptoms referable to that portion of the nervous system. It is furthermore noteworthy that the few lesions where found were clean cut and absolutely characteristic of multiple sclerosis. The case, therefore, is suggestive of the possibility of a purely spinal form of the disease, although it is altogether probable that as in this instance, if sufficiently careful search be made, sclerotic areas will be found in nearly all cases disseminated both through brain and cord, though perhaps predominantly localized in one or the other position.

Case II. E. F., single, twenty-eight years old, was admitted to the Long Island Hospital Nov. 3, 1897. She had had influenza, typhoid fever and rheumatism. She was not addicted to alcohol. For some months previous to her admission she had complained of disorders of sensation in the legs, with pain; also difficulty in walking. Her knee jerks at this time were exaggerated, but there was no definite ankle clonus; a certain amount of ataxia was noted in both legs and arms; no objective sensory disorders were observed; an uncharacteristic tremor was present, but apparently not constantly.

A more detailed examination made July 26, 1900, showed unimpaired sensibility; increased knee jerk, double Babinski, with a tendency to toe drop of the left foot; there was, however, no muscular atrophy; no ankle clonus; the arms showed no abnormality; a tremor of both hands was observed; there was marked ataxia, and the gait was spastic. Some months later a scanning type of speech was observed. Difficulty in locomotion increased. Patient was sensitive about being asked to walk, and usually refused; she could, however, get about with the assistance of a cane. Nov. 7, 1900, nystagmus was noted, more marked in the left eye, and tremor of the intentional type began to develop. Early in the following year she went about the ward with a chair pushed before her. Her general functions were normal; she slept well and complained of no special symptoms. During the summer of 1901 she had marked gastric disorder, associated with vomiting and diarrhea. On October 4, 1902, it was stated that for the past week she has not been able to walk or to get into or out of bed. There was thereafter slight improvement in this regard, but she practically did not walk after this time; the legs were extended and spastic.

Examination Jan. 22, 1903, was as follows: Patient has not walked without assistance since August on account of disturbance in the legs; there was no nystagmus even on lateral fixation; tongue protruded straight; no facial paralysis; other cranial nerves not involved; there was a very considerable coarse tremor of the hands on intended movement; walking was impossible, apparently on account of spasticity, and on account of the patient's lack of confidence; knee jerks were much increased; ankle clonus well marked on the right, slight on the left; there was strong spastic contracture of the knees; Babinski on both sides; sensation was apparently unimpaired in the legs; her speech was not typically scanning, and she claimed to have no urinary disorder or subjective disturbance of sensation; she moved the right arm more freely and with less tremor than the left.

Thereafter she was up, but complained of more or less pain in her legs, and was inclined to be emotional if talked to regarding her condition. On April 27, 1903, it is noted that the patient had cried for two days almost constantly; that her speech was notably thick, making it difficult to understand her; her left arm was absolutely powerless; she was obliged to lift it with the other hand; there was also an increase in spasticity in the legs; pain in the legs was her chief complaint. May 5, her temperature rose to 100 and 101 degrees, and there was increased weakness, with much unintelligible talk.

Detailed examination at about this time showed that the left eye opened less widely than the right; both reacted well to light and distance; there was no nystagmus; very slight facial paralysis on the left; arms and legs both spastic; persistence of Babinski sign; increased Achilles reflex on the right, absent on the left; ankle clonus on both sides, with much exaggerated knee jerks; abdominal and epigastric reflexes both absent; wrist jerks markedly increased on both sides; answers to questions unintelligible.

From this time on until death, May 19, the patient had varying elevations of temperature, with temporary marked improvement, but on the whole grew weaker and more fretful. On May 12, the blood count showed 16,000 whites, with hemoglobin 95 per cent. There was slight involvement of the lungs. May 18, her temperature rose to 104.4, but fell after a sponge bath. She was able to talk and apparently had no pain. May 19, she was semi-comatose during the day; became entirely unconscious and

cyanotic; respiration showed many coarse tracheal râles, and she died late that night.

Autopsy No. 03:54 (616): By Dr. G. P. Magrath, May 31, 1903. Thirty-five hours post-mortem.

Anatomical Diagnosis: Chronic adhesive pleuritis; hydropericardium; fatty degeneration of the heart; dilatation of the right ventricle; acute fibrinous pneumonia; atelectasis; edema of the lungs; thrombosis of the lateral sinus; ecchymoses of the cerebellum; diffuse degeneration of the spinal cord.

Body: That of a woman thirty-two years of age; length 150 cm.; well developed and nourished; rigor mortis present; post-mortem lividity of dependent parts; pupils equal 0.2 cm. in diameter.

Upon section, subcutaneous fat 2.5 cm. in thickness; muscles red and firm; vermiform appendix and mesenteric lymph nodes normal.

Thorax: Height of diaphragm 4th rib on right side, 5th on left.

Pleural Cavities: Left shows a few fibrous adhesions at the apex; right normal.

Pericardial Cavity: Contains about 75 cc. of clear, straw-colored fluid.

Heart: Weight 250 gms.; epicardial fat abundant; upon section myocardium pale reddish-brown and flabby. Wall of left ventricle 1, of right 0.2 cm. in thickness. Mitral valve 9.5, aortic valve 6.5, pulmonary valve 7, tricuspid valve 11.5 cm. in circumference. Depth of left ventricle 9 cm. Valves normal; cavity of right ventricle slightly dilated. Coronary arteries normal.

Lungs: In general alike; for the most part crepitant and of a grayish-pink color; the back of each lower lobe is dark bluish red and partially collapsed, its consistence a little increased; the left lower lobe at its base in mid-axillary line shows a region of solidification about 2 cm. in diameter; the pleura over this region on the under side shows a little fresh fibrinous exudate; upon section apparent as a gray-red area, finely granular, and slightly elevated above the general surface; the surface of section as a whole, in the front of the lung pink, in the back cherry red; upon pressure yielding considerable bloody, frothy fluid; bronchi negative.

Abdomen: Peritoneal cavity normal.

Spleen: Weight 200 gms.; upon section, follicles distinct; pulp dark red, very slightly increased; general consistence fairly firm.

Stomach: Normal.

Pancreas: Negative.

Intestines: Not remarkable.

Liver: Weight 1300 gms.; surface smooth; general color brown red; upon section, lobules distinct; consistence normal.

Gall Bladder: Normal.

Kidneys: Weight of both 250 gms.; upon section, capsule strips easily from a smooth surface; markings distinct; general color faintly gray-red; cortex 0.6 cm. in thickness; glomeruli visible as pink points.

Adrenal Glands: Normal.

Bladder: Capacious; upon section, normal.

Genitalia: Negative.

Aorta: Normal.

Cranium: Upon section, membranes normal. The right lateral sinus upon section, presents a mass of clot somewhat flattened against the posterior wall, very slightly adherent, rather dry and brittle, for the most part gray, in places flecked with red.

Brain: Weight 1150 gms.; cerebrum negative; the cerebellum upon its upper surface presents two to three areas of ecchymosis about 1 cm. in diameter; otherwise negative; arteries of the base normal. Organ preserved entire for further examination.

Spinal Cord: General contour normal; in places at all levels, more especially in the lower thoracic region, are areas apparently upon the free surface, within which the substance of the cord is somewhat depressed, the cord at the site of the region, in one instance, being symmetrically diminished in size; the lesions are slightly fluctuant and are of a transparent, faint, bluish-red color; section through such a region shows upon the cut surface areas of varying shape and extent, transparent, of the same color more or less gelatinous; at the level of a section made through the lower part of the cervical enlargement, nearly the entire area of the cut surface is transparent and gelatinous; small wedge-shaped areas upon the dorsal, and ventral aspects of the cord alone being white and opaque. Sections at intervals of 2 cm. throughout the length of the cord, show upon the cut surface, widely varying pictures of more extensive degeneration, apparently in the cervical and lower thoracic segments.

Microscopic Examination. In this case detailed examination showed a general distribution of the disease throughout the hemispheres, oblongata and cord, together with noteworthy lesions in nerve roots to which special reference will later be made. The character of the sclerotic areas was both of the sharply circumscribed variety and of the more diffuse type, the two often occurring together in the same cross section. The gray and white matter were indiscriminately involved.

Lumbar Cord. In the lumbar cord there were many diffuse areas of degeneration, many of them wide in extent. The thoracic cord also showed extensive areas, at one level studied involving the entire cross section, with the exception of a few isolated fibres. The nerve cell bodies and their nuclei were of normal contour and well preserved without undue pigmentation. In certain areas near the periphery and widely separated from each other groups of myeline sheaths (Weigert), so few that they might easily be counted, were partially preserved. The vessels throughout this area were filled with blood corpuscles, but except for possible thickening of the walls were normal in appearance, and not to be brought into direct relation with the areas of sclerosis. The neuroglial overgrowth was not in every part dense, varying distinctly in character in different areas studied. The pia as elsewhere was normal. The cervical region showed many areas of degeneration with a certain tendency to discrete patches. The degeneration was of varying grades of intensity and showed a somewhat symmetrical distribution vaguely simulating a diffuse combined degeneration. A large central area involved the gray matter ventrally. Nerve cell bodies showed no further alteration than already described. In the oblongata there were fewer lesions proportionately than in the cord. The brain, on the other hand, contained many lesions, often extensive. The frontal lobes, the anterior portion of the corpus callosum, the walls of the ventricles, the pillars of the fornix, and the fornix itself, together with parts of the cerebellum were all involved. No special peculiarities were noted either in the areas of sclerosis or in the blood vessels of the brain.

Nerves Roots and Peripheral Nerves. The lesions deserving special attention in this case, and only occasionally hitherto described, were alteration in spinal nerve roots, both ventral and dorsal. In nerve roots of the

thoracic region and, therefore, considerably removed from their cells of origin, numerous sclerotic areas were observed analogous to lesions occurring in the cord itself. In one nerve root studied (see Fig. 5) a large number of discrete patches were found, irrespective of blood vessels, and showing a typical myeline degeneration without other apparent change. Sections stained by Mallory's phosphotungstic acid-hematoxilin method showed no sign of neuroglia overgrowth. The claim that neuroglia extends a certain distance into the peripheral nerves from the cord does not explain the lesions here observed, and the conviction is strong that the lesions are localized sclerotic areas characterized by the usual disintegration of myeline without either primary or compensatory neuroglial overgrowth. It was also not possible to establish any relation whatever between these areas and the blood vessels. In many instances they were absolutely removed from vascular supply so far as the microscope revealed. The axones were evidently preserved in great measure in the degenerated areas, and the fragmentation of myeline was similar to that observed in ordinary degenerative conditions. The peripheral nerves so far as studied showed no degeneration. The probable significance of these nerve root lesions will be discussed more fully later in this paper.

This was one of the two cases in which a diagnosis was made during life. During the greater part of its course the symptoms resembled far more closely an ataxic paraplegia than a typical multiple sclerosis. The diagnosis was finally made, however, with comparative certainty on the basis of tremor, a certain speech defect and the general clinical picture. Post-mortem examination revealed, as the foregoing description indicates, a perfectly typical multiple sclerosis involving with considerable regularity various portions of the nervous system and, therefore, naturally giving rise to a symptom-complex of fairly definite character.

Case V. C. F. R., married, twenty-six years old when first seen, was referred to me by Dr. Henry Jackson, July 31, 1900.

He was at the time not working and was a member of various clubs. He had been a heavy drinker for seventeen years, but had abstained entirely since March 1, 1900, excepting for a very little whiskey. He had had a mastoid operation three years previously and pus was found. His symptoms were relieved.

On March 21, 1899, he awoke one morning with poor sight in his left eye. He consulted an oculist, but does not know what the condition was. He had blurring of vision, which has improved, but never recovered. During September and October he was uncertain in walking and staggered on the street. This he could not account for, since he was generally feeling well. This condition had not improved. For about a year he had had pain, usually at night, in the left arm. This also occurred occasionally during the day and he attributed it to indigestion. The pain seemed to extend to the back of his head, but was never sharp. He noticed also a flickering before the eyes. In February, 1900, he thought of diabetes, but sugar was not found. Lead poisoning was then considered, and a certain amount of

lead was found in the urine. He was at the time living in an old house, the plumbing of which was not above suspicion. He had taken iodide of potash for a long time, which he thought had upset his stomach, but he had no colic, and he thinks there was no lead line. In March, 1900, he wrenched his right arm, which had been injured five years before. In a day or two it became numb and weak. He was treated by an osteopath. The left hand had recently begun to feel numb, which the patient also attributed to the iodide of potash. A long walk seemed to "make his ankles give out." He had had some urinary retention for about two months, again attributed to iodide of potash. His bowels had not been disordered. There was no history of ocular palsies, no vomiting, no lancinating pain and no headache. His sleep was poor, but his spirits remained excellent. He had of late noticed toe drop on becoming tired.

Physical Examination. His right arm was smaller and weaker than his left; the right hand grasp was poor. The muscles were in general flabby. There was no objective disorder of sensation and no pain on deep pressure over the nerves. The legs showed good muscular development. The knee jerks were very active, there was distinct ankle clonus on the right, which was not obtained on the left. There was also a probable slight Babinski on the right. There was no objective disturbance of sensation beyond a considerable loss of the sense of position. The cremaster and abdominal reflexes were lacking. There was considerable Romberg. The pupils were equal and gave a good response to light and on accommodation. Faradic stimulation of the muscles of the forearm and hand showed nothing abnormal.

A report of the condition of the eyes, as made by Dr. David Harrower, was as follows: April 8, 1899, right eye normal, left eye 3-10 vision. Visual field, reactions and the fundus were normal. May 1, slight floating opacities were noted which cleared up. In June, slight improvement in vision was noted. In January, 1900, the nerve head was pale and there was a question of atrophy. In May, the eye was normal in every respect, except in vision, which was then 6-10.

Diagnosis made at the time, diffuse lesions of the cord (syphilis, lead).

When this patient was seen, five years before his death, it was probably impossible to make a definite diagnosis. The exact course of events which followed during the years preceding his death are not definitely known to me. The autopsy, however, revealed multiple sclerosis, and, as already stated, the subsequent history of the case, together with the microscopic findings, will be reported in detail by Dr. F. H. Baker and Dr. Hoch, of Worcester. They have kindly allowed me to present the preliminary history as obtained by me some years before, which is interesting in view of the very marked but wholly indefinite symptoms as then observed. The idea of multiple sclerosis did not enter my mind, although no doubt it should have done so.

Case VI. M. S., thirty-six years old, widow, born in Ireland, was admitted to the Long Island Hospital Dec. 5, 1898. The family history is

not important. Patient had always been well; she had had two children, both healthy, but who have since died; one miscarriage, said to have been the result of falling downstairs. She denied venereal disease and gave no definite history of infectious disease; she had taken alcohol in excess, chiefly beer.

About a year before entrance to the hospital she noticed an increasing weakness of the legs; also unusual "motor nervousness"; she was told by a friend that her face did not look natural, which she verified by looking into the mirror and finding that her face was drawn to one side; she had had no pain, and did not know of this change until told. In two weeks her symptoms had entirely disappeared, and they did not return until eight months previous to her admission, when she says that she caught cold; her right arm and leg became weaker, and she found she could not do her work satisfactorily, which was waiting on table.

Eight months later she began drinking again, and was wholly unable to do her former work. Her strength began to fail and she finally came to the Long Island Hospital Dec. 5, 1898. Beyond general weakness, particularly noticeable on the right side, nothing especially abnormal was found, and she later returned to the city, re-entering the hospital in October of the following year. Some slight facial paralysis, slight ataxia, and general weakness were noted at this time.

Notes made during the following months show that the reflexes were increased; that she had the Babinski sign; that there was slight nystagmus of both eyes; that her speech was slow and scanning, with much spasticity of the lower extremities, but without definite disorder of sensibility. A year later she had increasing difficulty in walking and often fell; tremor of hands at times prevented her from grasping a support, and she gradually became confined to her chair. Beyond the general symptoms noted she was well; her appetite was good; bowels regular; sleep satisfactory, and she made no complaints.

Oct. 30, 1901, she was unable to feed herself with her right hand because of tremor, but she could use her left. Careful examination at this time showed no disorder of sensibility.

A detailed examination made July 10, 1902, was as follows: As the patient sits in chair with head resting there is practically no tremor either of head or extremities; on raising the head a marked tremor, coarse in character, is apparent. The patient naturally sits with her head supported; on attempting to make any intended movement a very marked tremor manifests itself, very much more pronounced on the right side than on the left; this tremor affects not only the arm in use, but also the entire body and head; for example, an attempt to button a large button with the left hand is accomplished with difficulty and considerable tremor; the same action with the right hand is absolutely impossible, owing to the increasing violence of the tremor; an attempt to write, even with the left hand, is entirely impossible, the whole body being thrown into a violent tremor. An attempt to make definite movements with the legs while in a sitting position is carried out with apparent weakness and very imperfectly, owing to the tremor; it is also impossible for her to stand alone; the attempt to rise from a sitting posture with support is effected only with a violent exacerbation of the tremor. The patient does not walk, or attempt to get about without assistance.

The speech is of a perfectly typical scanning character. There is no oscillation of the eyes on direct fixation in a straight line; on attempting

to follow the finger to one or the other side a marked oscillation develops, with inability to fix the eyes for any length of time; the pupils are equal in size. There is slight asymmetry of the face, but no paralysis of any of the cranial nerves. Watch tick heard better on the right than on the left; on the right at a distance of about two feet, on the left three or four inches approximately. Muscles are well formed and sufficiently voluminous, with no evidence whatever of atrophy; except for the tremor, the active and passive movements of the arms are free, and the hand grasp on both sides is of a fair degree of strength; no paralysis of legs, the movements being effected with slight appearance of weakness, but otherwise normally, apart from the tremor. The knee jerks are much increased, and there is marked ankle clonus on both sides; also marked Babinski on both sides; abdominal and epigastric reflexes absent; slight increase in deep reflexes of the arms. Light touch and pin prick felt apparently over the body and limbs; patient makes no complaint of numbness, pain or other disturbance of sensation.

The heart and lungs are normal. Bowels are regular; appetite good and sleep undisturbed; no disturbance of micturition. The mental state on the whole is normal, but patient possibly shows some defect in memory, and a slightly abnormal sense of well-being.

August 6, 1902, condition not much changed since recent examination; she suffers no pain, but is heavily handicapped by tremor, as she cannot comb her hair, feed herself, or even pick up anything without great difficulty; she is barely able to raise herself from her chair with the assistance of the bed, which she grasps with both hands.

Sept. 20, patient feels well, but is almost helpless; she is unable to walk or get in and out of bed, although she dresses herself; she has not sufficient control over her hands to feed herself; speech is as before.

Examination April 9, 1903, was as follows: Feet are very cold and somewhat cyanotic; ankle clonus on both sides; very active Achilles reflex on both sides, which throws the feet into clonus; front tap on the left is very marked, absent on the right; Babinski reflex by the ordinary test is not obtained, but by stroking the anterior portion of the sole of the foot at the base of the toes, typical Babinski phenomenon is obtained; there is practically complete loss of muscle sense in toes; pain sense is somewhat diminished over the feet; sense of contact is preserved, although answers to questions concerning sensation are sometimes uncertain; there is marked disturbance of muscle sense in the hands; no individual tremor of the head except when held in a certain position; no cranial palsies; difficult fixation of eyes.

Oct. 30, 1903, definite disturbance in the sense of position in toes was noted.

Since the foregoing examination there was a constant gradual failure up to the time of her death, with an increase in all symptoms; speech became scarcely intelligible; tremor remained very much greater on the right than on the left; movements of any sort were practically impossible, on account of the violence of the muscular tremor; there was a somewhat definite tendency toward mental failure, but the sense of well-being continued; there were no complaints whatever of pain; exact determinations of sensory disturbance became difficult owing to the mental state of the patient.

The urine showed no significant abnormality.

Examination of the eyes by Dr. F. M. Spalding showed no central color scotoma; normal fields of vision somewhat reduced; the disc showed pallor of the temporal quadrant; fundus otherwise normal.

During the latter part of her illness a peculiar tremor of the diaphragm was noted by Dr. Thayer, house officer at the hospital, which he aptly termed a tremor of the intention type, inasmuch as it was not elicited on ordinary breathing, whereas on taking a deep breath a peculiar oscillatory movement of the diaphragm was observed. The patient died March 20, bed-sores being an immediate cause.

Autopsy: Autopsy, twenty hours post-mortem, by Dr. S. B. Wolbach. Typical cerebrospinal sclerosis was apparent on section of the cord and brain, verifying the diagnosis during life, which was unmistakable, and was the best example which has come under my observation of the classical picture of the disease. A detailed description of the microscopic findings in this case is postponed to a later publication, owing to the fact that this paper was practically ready for the press at the time of the patient's death, and further delay seemed inadvisable.

The following cases, with but one exception without autopsy, are reported partly as unmistakable cases of the disease and partly as illustrating some of the difficulties in diagnosis in conditions of long standing in which certain signs and symptoms are well marked. Many more might be added to this list, but they would not serve to illustrate further points which it is desired to emphasize.

Case VII. M. R., forty-four years old, unmarried, a bartender, was admitted to the Long Island Hospital Oct. 24, 1899. His family history shows nothing bearing on the present condition. He has had the children's diseases. Gonorrhea fifteen years ago, but no other illness excepting the present. He has not used alcohol to excess.

According to his statement, twenty-seven years before entrance to the hospital he noticed a tremor of the left hand while holding a glass in process of mixing a drink, which rendered it difficult to hold the glass steadily. In a short time the other hand became involved in a similar manner; then the legs became stiff, and somewhat weak, and a coarse tremor developed when he attempted to walk; finally the head likewise became involved in this tremor; all in a period not exceeding five years; the patient often fell, and attributed his difficulty to weakness; he had never had pain; with the exception of the coarse tremor and the difficulty in walking he felt in good general health; there was no mental impairment; no bladder or bowel disturbance.

Physical examination at this time (1899) showed a well developed man; his pupils were equal and reacted to light and on accommodation; nystagmus was present; there was no tremor of the tongue; the heart showed no abnormality, nor did the other internal organs; the knee jerks were extremely active, but there was no ankle clonus; the plantar and cremasteric reflexes were present; wrist jerks were also active; there was at this time no impairment of sensation and no trophic disturbance; his speech was noted as hesitating, slow and of a general scanning type.

His condition for the succeeding four years remained essentially unchanged, with a possible slight increase in the severity of the symptoms.

He was examined May 19, 1905, and the following conditions noted: He still has no complaint beyond the tremor and no pain whatever; oc-

asionally his hands and feet feel as if asleep; he has had no difficulty in micturition; his memory is unchanged; he repeats difficult test sentences with alacrity, and his capacity for mental work appears unimpaired.

Physical examination shows his speech to be decidedly thick, often indistinct, not clearly of the scanning type, but possibly approaching that more than any of the other recognized speech disturbances; his head is in continual oscillation; there is a definite tremor of the intention type of the hands, which extends to the body and to the legs on movement; nystagmus, both when he looks ahead and on lateral fixation, is very marked, both rotating and lateral in character; pupils show a very sluggish light reaction with retained accommodation, without disturbance in the visual field, as somewhat roughly tested. The deep reflexes are all active, both in the arms and legs; the abdominal and epigastric reflexes not obtained; there is no definite ankle clonus, but it is strongly indicated on the right; sensation, including muscular sensibility, is apparently normal; he has no sphincteric disturbance whatever; there is likewise no Babinski phenomenon or other reflexes of the great toe; he has much general tremor on standing with eyes closed, not, however, a true Romberg.

Case VIII. P. C. F., twenty-nine years old, was admitted to the Long Island Hospital, June 8, 1904. He was unmarried; a teamster by occupation. Both his parents were Irish.

The family history was unimportant. Patient had never been ill before; he denied venereal disease, but not exposure.

Four years before entrance he noticed a gradually increasing difficulty in maintaining his balance and had fallen many times. For a year he had noticed slowness of speech and hesitancy. His appetite was satisfactory; his bowels regular; he had no pulmonary, cardiac, or renal complication, or difficulty with the bladder function. He was accustomed to drink a pint and a half of whiskey a day. He, in general, suffered no pain and made no complaints. Physical examination on entrance showed a well developed and somewhat thin man; very intelligent in manner; speech was somewhat thick, with a suggestion of scanning. Tongue protruded straight, moist, slightly coated. Heart, left border slightly outside nipple line, sounds clear, occasionally intermittent, no murmurs; diffuse impulse; visible pulsation of carotids. Pulse of fair volume and tension. Lungs showed no abnormalities. Abdomen was negative; spleen not palpable; liver normal. Palpable glands in neck, axillae and groins. The left leg just above the ankle showed a half dozen pigmented areas, apparently healed ulcers, each about the size of a twenty-five cent piece; one much larger area having in its centre a crusted ulcer; there was a similar area on right leg. Genitalia showed no scars. Patient is unable to walk; stands with legs widely apart. A provisional diagnosis of multiple sclerosis was made. The urine showed no abnormality.

Patient was examined June 23, 1904, and the following notes were made: Pupils react strongly to light; no evidence of nystagmus; no difficulty in swallowing; tongue protruded straight in median line. Repeats alphabet quickly and accurately; writes, however, slowly and with great hesitation; character of voice suggests nasal occlusion, and examination of palate shows a paralysis of the left side, with an involved uvula and pharynx. The wrist jerks are lively; elbow jerks increased; slight jaw reflex; in moving the hands to the face slowly, the movements are made up of a series of short jerks, and there is considerable ataxia of arms; tremor of hands very slight, with slight tremor of head; knee jerk

increased, right a little greater than left; clonus on both sides, persistent on right, easily exhausted on left; plantar normal; no Babinski; the Achilles reflex active on both sides; cremasteric reflex equal on both sides; abdominal reflex active; sensation unimpaired over both legs and feet, and there is accurate muscular sensibility; there is, however, marked Romberg; the inguinal and epitrochlear glands are enlarged; no pain over nerve trunks. Repetition of difficult sentences like, "Third Riding Regiment of Light Artillery" is done with considerable difficulty, but he is able to add figures rapidly and accurately. He complains of an occasional sense of numbness in the legs.

Further examination by Dr. G. A. Waterman, July 7, 1904, is as follows: Motions of eyes normal in all directions, without nystagmus; sensation in face intact; watch tick heard 8 inches from the right ear, 18 from the left; normal field of vision; pulse 125 while lying in bed; radials and brachials both palpable; no atrophy of muscles; no fibrillary twitching; no tremor of lips or tongue.

Examination May 19, 1905: There has been no improvement; he has great difficulty in locomotion, much unsteadiness, not typically ataxic; he complains of a feeling of "deadness" from knees down, and has difficulty in micturition; bowels are regular; occasional headache; he has had no paralytic attack; speech suggests dementia paralytica rather than multiple sclerosis; there is slight ataxic movement of the hands, but no definite tremor; no nystagmus; pupils show no abnormality; no disorder of sensibility in the hands; the epigastric reflex not obtained on the left, present on the right; abdominal present on both sides; double ankle clonus, but now no typical Babinski; sensation in general unaltered; marked Romberg; field narrowed; reflexes of arms very active; many awkward movements.

Case IX. C. M. C., Neurological Department, Massachusetts General Hospital, No. 60,295. Thirty-eight years old, married, one child, by occupation a locomotive engineer. As a child measles, chicken pox and later malaria. Both he and his parents had always been well. He was not addicted to alcohol. Gonorrhea in 1889; no syphilis.

He first noticed in January, 1899, following a fall in which he injured his back the week previously, that his legs from the knees down felt numb in the morning, and that he had difficulty in walking. He was unable to place his foot where he wished, and, as he expressed it, "did not have free use of his legs." He remained about the same for two or three years, and remained at work until 1901. On account of difficulty in standing and walking he then gave up his employment, and went to bed for two weeks. In June, 1902, tremor became prominent, affecting every part of his body. He was unable to stand and was decidedly worse in this respect then than now. His speech changed; his head shook; his voice trembled, and he could not get about alone; his bowels were very costive. In the spring of 1903 there was considerable improvement. He was able to get about a certain amount by himself, but had difficulty in dressing. He was much troubled with urinary incontinence and frequency. During 1904 there was gradual improvement, and he did not notice the numbness of his legs. In 1902 he was unable to read because he could not hold his eyes steadily. This also had improved by 1905, and he was able to do work about the house. He had had no general vertigo, no headache, no pain, no definite stiffness or pronounced weakness, nor had he had apoplectiform attacks nor uncontrolled emotionalism, although he had been from the first somewhat unnaturally happy.

Physical Examination. Examination early in 1896 gave the following conditions: Gait, markedly spastic-ataxic, with the element of ataxia predominating. The feet separated widely in walking. On effort the whole body, including the head, shakes violently. The left arm and leg are much worse than the right. Romberg sign well marked; knee jerks very active, but without clonus or Babinski reaction; no abdominal or epigastric reflexes, cremaster present and active, arm reflexes active; no cranial nerve palsy, and strength intact; no objective disorders of sensibility, contact, pain or muscle sense. General nystagmus in all directions interfering with the reading of test type at short distances. Pupils equal with normal light reaction and undisturbed accommodation. The right optic disc somewhat paler than the left, but both apparently paler than normal. There is excessive tremor in all parts of the body, including the head, constituting with the other symptoms, an absolutely typical picture of the disease. The mental condition showed definite euphoria, but without other signs of mental defect or deterioration.

Cases VI, VII, VIII and IX are unquestionably multiple sclerosis. Case VI has been observed at the Long Island Hospital for upwards of seven years, and during that time has presented characteristic symptoms of the disease, excepting for a relatively short period at the beginning of her illness. The clinical picture at that time was a practically uncomplicated spastic paraplegia of pronounced type which has persisted, but to which has been superadded an absolutely characteristic tremor and speech defect, together with nystagmus. Attention should be especially drawn in this case to the very much greater intensity of the tremor on one side. The case in general stands out prominently as an example of the classical type of the disease in distinction from others reported with autopsies in this paper and from those to which allusion will hereafter be made. This patient has failed rapidly within the past few weeks, and her death is expected within a short time.*

Cases VII and VIII have likewise been closely observed at the Long Island Hospital for several years and there is small doubt that they are likewise suffering from multiple sclerosis, although the so-called cardinal symptoms are far less definitely marked than in Case VI. Case IX admits of no question in diagnosis. The extraordinary extent of the head tremor is worthy of note, with an early development of tremor and other motor disorders.

*The patient has since died, and the autopsy has confirmed the clinical diagnosis, as stated in another place.

Case X. J. O., fifty-seven years of age, single, born in England, was admitted to the Long Island Hospital May 22, 1905.

Family history: Father and mother died in old age, both of pneumonia; one sister at twelve years of age, and following scarlet fever had repeated attacks of epileptic convulsions; she died at the age of fifteen during a convulsion.

Patient has had all the diseases common to childhood. At the age of eight, following scarlet fever he began to have "epileptic convulsions" every month, at about full moon; he was free from convulsions at other times. He has not attended school since he was eight years old; has always been considered intelligent. In these attacks he would fall rigid, hitting his head first; no history of biting his tongue; no prodrome; these seizures have diminished in number in the past thirteen years. He has not worked for thirty years; his occupation was that of a blacksmith, but he was obliged to give up work owing to tremor in using tools. He has much difficulty in feeding himself; tremor is intensified when he attempts motion. Rheumatism two years ago. His habits have been good.

For the past six months patient has been going down hill; there is an almost constant twitching of sets of muscles, especially of the face, and once or twice daily he becomes unconscious, knowing nothing of his surroundings, or of what has happened; he has not injured himself of late; these attacks do not resemble his former epileptic convulsions. He often thinks he has eaten his dinner when he has had none, and vice versa; is capable of doing odd jobs about the house and garden, trimming the lawn, etc.; memory is very poor and he does not like responsibility; when out of doors he requires a walking stick, and has much difficulty in the position of his feet; no change in speech; eyesight and hearing good; he has no pain; no vertigo; no areas of numbness, tingling or anesthesia; no cardiac, pulmonary or vesical symptoms; his appetite is good; he does not vomit; bowels are regular.

Physical examination at entrance is as follows: Patient well developed and nourished; general condition good; intelligence normal; intermittent spasms of all the muscles of the body; attacks are spasmodic and seem to pass from one group of muscles to the other; twitchings are so marked as to interfere with patient's equilibrium; there is marked intentional tremor of the upper extremities, which seems to be independent of the spasm. Pupils are equal, react to light and on accommodation, with normal motions in all directions; tongue is protruded straight, slightly tremulous, clean and moist; no glandular enlargement; pulse is regular, of good volume and tension; radial and temporal vessels thickened and tortuous; lungs negative; heart within normal area, sounds forcible, rate regular, somewhat rapid; second aortic increased. no murmurs; abdomen negative. The knee jerks are present; no clonus or Babinski; plantars not obtained; no Romberg; the gait is shuffling and somewhat ataxic; there is marked incoördination of the upper extremities; no motor or sensory disturbance; muscle and position sense normal; patient is able to distinguish hot and cold objects; no girdle or lightning pains; no gastric disturbances.

Urine of normal color, acid reaction, sp. gr. of 1030, no albumin or sugar.

May 23, examined by Dr. H. A. Christian: Knee jerks present on both sides, more active on the right; while testing knee jerk a tetanic contraction of the gastrocnemius and soleus muscles of the right side appears

and lasts about one minute, apparently accompanied by some pain; this is repeated several times during the course of ten minutes.

Examination May 27, by Dr. G. A. Waterman is as follows: Mentally normal; remembers recent events; repeats sentences well; eye movements are normal, except oscillation, when looking to the extreme right or left; pupils are equal, react to light and distance; face flushes easily; speech not remarkable; tongue protruded normally, and without effort; hands and arms remain at rest except for an occasional quick twitch; on attempting to touch examiner's finger or balance articles, either hand is thrown into violent coarse, jerky tremor; grasp is strong, right equals left; wrist jerk absent; radials tortuous and thickened; no trouble in passing urine; sometimes incontinent, never wets the bed; cremasteric reflexes absent; touches object with elevated foot without much ataxia; knee jerk present, brisk; extended leg flexed at hip to right angle; no clonus nor Babinski elicited; no plantar; watch tick heard six or eight inches from the right ear, not heard on the left; bone conduction better in right ear; reads newspaper without difficulty. At the beginning of examination patient was quiet much of the time, with an occasional jerk, now of the head, now an arching of the trunk with spasm of the diaphragm, causing a grunting noise; now a quick twitch of either arm or leg; effect of standing causes violent movements of body and throwing about of the arms; patient walks with his toes out and feet apart, kicking legs out to full extension like a tabetic, balancing body from hips and swinging arms; he is occasionally obliged to stop and start afresh.

Ophthalmoscopic Examination: Fundus shows no atrophy or alteration of either optic nerve.

Examination July 1, was as follows: Patient has had tremor for nineteen or twenty years, which came on gradually; no true nystagmus is observed; on fixation of the eyes the whole head is thrown into violent movement; great dyspnea and a pulse of 144 induced by walking through the ward; an attempt to button produces an apparently typical intention tremor involving head and body; considerable euphoria.

Case XI. C. I., thirty-four years old, unmarried, born in Boston, formerly occupied in housework, was admitted to the Long Island Hospital May 17, 1905.

About eight years ago her difficulty began with trouble in walking, and in using the left arm, and a diagnosis of lateral sclerosis was made by the attending physician. This condition steadily progressed until she reached the condition in which she now is, about one year ago. It was stated that about sixteen years ago she lay in a cataleptic state for four days following the sudden death of her father, but beyond this attack she was perfectly well up to the onset of the present disease. Her mother has recently died of carcinoma; she has one sister living and well; two brothers died in institutions, one imbecile, the other epileptic; a sister died at the age of seventeen, imbecile and paralytic, said to have been the result of meningitis in early childhood; still another sister died of gall stones and exhaustion attendant upon caring for the defective members of the family.

It is not possible to obtain any history from the patient herself, owing to the fact that speech is impossible, and her sign language imperfect.

Physical examination at entrance is as follows: Fairly well developed and nourished; of average intelligence; skin and mucous membrane of good color; paralysis of the tongue; chest symmetrical, equal expansion, good resonance, but with numerous fine crackling rales over both front

and back; the heart is negative except for a soft systolic murmur, not transmitted, probably hemic in character; except for possible slight enlargement of the liver abdomen is negative; spleen not palpable; epitrochlear glands slightly enlarged on both sides; otherwise no glandular alteration; pulse 90, regular, weak, of poor volume, easily compressible.

Examination June 3, by Dr. G. A. Waterman: Distinct twitching of the eyes on looking upward; movements in all directions somewhat limited; unable to look to the extreme right or left on account of jerking movements of the eyeballs; on attempting to protrude tongue the left corner is pulled up, the right only slightly so; unable to open mouth widely or protrude tongue beyond teeth; the tongue, however, does not appear atrophied; hearing of watch tick normal in both ears; seems to understand perfectly what is said; absolutely unable to move left arm, hand or fingers; slight flexion and extension of fingers of right hand possible, and she is able to move the arm in an ataxic fashion at elbow and shoulder; rigidity at both shoulder joints and left elbow, while both hands appear flaccid; no abdominal reflex; she is unable to sit or stand; both legs are held flexed at the knees, with adductor spasm, but can be easily straightened; she is unable to move either foot or leg; is incontinent of urine; sensation, so far as tests could be made, seems normal; there is double Babinski and ankle clonus, with increased knee jerks; patient sits or lies with her face turned toward the right.

Personal examination June 10, 1905, was in general confirmatory of Dr. Waterman's observations. The condition found was as follows: Movements of face somewhat limited, but without definite paralysis; tendency to emotionalism without cause, particularly laughing; head as she sits in the chair turned toward the right; oscillation of the head when held free; respirations somewhat labored; some drooling. Left arm, tendency to rigidity at elbow; no elbow reflex; no wrist reflex; apparently definite atrophy of the small muscles of the hands, especially the interossei, much more marked on the left than on the right, where objective atrophy is doubtful; paralysis of the left arm and hand complete. Right arm, no rigidity; can be moved, but with definite ataxic tremor; no static ataxia of right hand; no elbow jerk; slight wrist jerk; nystagmus on upper fixation; on emotional expression the left side of the face moves somewhat more than the right; knee jerk decidedly increased; front tap present on left, not obtained on the right; absolute paraplegia of both legs, more spasticity of the left; double Babinski and ankle clonus; considerable cyanosis of legs and feet; dorsalis pedis artery not felt in left foot; no edema of feet.

Case XII. The following patient has recently presented herself at the Massachusetts General Hospital: M., thirty-five years of age, house-keeper by occupation, Irish, the mother of three healthy children, gave an uneventful family history. She had had diphtheria when a child. Other than that no illness of significance. About one year ago she first noticed vertigo; six months ago there was an apparent blurring of vision, relieved by glasses; from six to eight weeks ago weakness of the legs came on suddenly. This steadily increased; she had particular difficulty in raising her feet to go upstairs. Within five or six weeks she had developed a marked and extremely troublesome tremor of the intentional type. She also about this time noticed a certain difficulty in speech. There was no disturbance of sensation nor of the sphincters nor of her general health. She had, however, become practically helpless on account of extreme weak-

ness and tremor, which latter was absolutely unnoticeable when sitting quietly.

Physical examination made March 11, 1906, gave the following results: Pupils equal, somewhat widely dilated, normal light reflex with preserved accommodation, lateral fields normal, nystagmus-like movements on lateral fixation both sides. Fundus, well marked physiological cupping, no neuritis of either eye, both discs pale and with apparent greater pallor on the temporal side. There was no paralysis of the cranial nerves, although she had occasionally had some difficulty in swallowing. Arms; strength of the hands and arms good and all movements possible. On ordinary tests there was slight ataxic tremor of the arms, but far less than one would expect from her general uncertainty of movement. Wrist and elbow jerks very active; hands moist and cold; sensation unimpaired. Legs; strength markedly diminished. Movements of the feet especially imperfect; dorsal flexion of the right foot only slightly possible, left better. Knee jerks much exaggerated; double ankle clonus; double Babinski sign; Achilles jerk active. Walking impossible without much help. Impossible to stand without assistance. Considerable tremor aroused by the attempt to walk, the gait apparently combining a large element of weakness with spasticity. Sensibility of the feet and legs unimpaired. Abdominal and epigastric reflexes lacking, liver not enlarged, and abdominal examination negative. Heart normal. Pulse 92 and not noteworthy. Speech slow and strongly suggestive of the scanning type. Test phrases well remembered, but imperfectly enunciated. Handwriting imperfect, characterized by tremor which tends to increase toward the end of words. In spite of rapidly increasing disability, there is considerable sense of well being, but without undue emotionalism.

Difference of opinion existed regarding the diagnosis of Case X during life. He was examined by various persons and the concensus of opinion was in favor of the diagnosis of multiple sclerosis, although his symptoms were atypical. It was difficult to interpret the signs observed during life, and the diagnosis provisionally made was by exclusion rather than by direct evidence. The patient, without showing signs of mental aberration, finally disappeared from the institution and his body was recovered several days later from the water. It was not determined whether his death was intentional or accidental. The latter may well have been the case. The most scrupulous dissection of the nervous system was made, which was well preserved. A detailed macroscopic study of the brain and spinal cord had failed to reveal any evidence whatsoever of multiple sclerosis, and it may fairly be said that no such lesions existed. Whether or not this case is to be included in the category of the so-called pseudo-sclerosis of Strümpell or not must remain undetermined; it is, however, certain that it is not an ordinary type of multiple sclerosis. The case is instructive since one was much more likely

to make a diagnosis of multiple sclerosis than in many others in which the pathological examination has demonstrated its existence. Undoubtedly, however, too much stress was laid upon the tremor, which closely simulated that of multiple sclerosis.

Case XI is likewise one of doubt. The clinical history and the present condition do not permit of dogmatic diagnosis. It does not fit into the picture of any other disease of the nervous system and it must be admitted does not closely correspond to multiple sclerosis as ordinarily interpreted. Attention is drawn to it here simply because after careful examination this diagnosis seems the most probable. If it be multiple sclerosis, it is an admirable example of the so-called bulbar type.¹³ The possibility of an amyotrophic bulbar paralysis cannot be entirely excluded as the predominant lesions in the case.

Case XII evidently presents several points of interest, among which the suddenness of onset and rapidity of development take first place. So far as one can learn from the history given, the onset was apoplectic in character, excepting for the vague disturbance of sight which had existed for about a year. The motor weakness associated with a high degree of spasticity, together with the total absence of sensory or sphincteric disturbances is altogether suggestive of multiple sclerosis. The speech, tremor, and the combined picture of disease which these various symptoms have produced make the diagnosis of multiple sclerosis probable, and in spite of certain anomalies, particularly of onset, this diagnosis must stand as by far the most reasonable.

FREQUENCY.

The recent animated discussion regarding the frequency of multiple sclerosis has not brought much light. It has, however, attracted renewed attention to the disease in this country and no doubt led clinicians to search more thoroughly than heretofore for its occurrence. It is not necessary to review in detail the results of statistical studies as made in Edinburgh, on the Continent of Europe and in America. Bramwell, Strümpell, Jelliffe,

¹³Claude: *Forme pseudo-bulbaire de la sklérose en plaques*, *Rev. Neurolog.*, xiii., 438, 1905. Mass: *Ein Fall von Multipler Sklérose mit pontinem Beginn*, *Berl. Klin. Woch.*, xlii., 993, 1905. Pfeifer: *Ein Fall von klassischer multipler Sklerose des Zentralnervensystems mit anatomisch ausschliesslich, bulbärer Localization*, *Jahrb. d. Hamb. Staatskrankenanst.*, viii., pt. 2, 14, 1904. See also Case II., reported in this paper.

various members of the New York Neurological Society and others, have interested themselves in this question with results of such wide disparity that they must be regarded as of value only as the beginning of a research which must be long continued if the actual facts are to be obtained. In the preface to Müller's monograph Strümpell affirms that multiple sclerosis is one of the commonest organic diseases of the nervous system and among the country population of Germany decidedly more frequent than tabes. He thinks it less frequent in the cities and among the higher classes, a point of view which so far as I am aware has not been previously expressed. Bramwell is, in general, in accord with this view of Strümpell and it is altogether probable that the disease occurs more frequently in Europe than in America, but not to the degree ordinarily supposed.

The concensus of opinion at the discussion of this paper by members of the Neurological Association was that the affection is more common in this country than has been supposed, and I am inclined to go still further than this and say that it is a common organic disease, though in my experience far less frequent than tabes. Some of the apparent reasons for our neglect of the disease in America may be found in the predominance of out-patient clinics and the failure to follow cases to their end, with the consequent lack of autopsy reports. The insistence upon so-called cardinal symptoms, the neglect to recognize and properly interpret other obscure signs, the doubtful significance ordinarily attached to uncomplicated spasticity, and the personal bias in diagnosis, all account for the infrequency of diagnosis. I have small doubt, and my own experience seems to justify this assumption, that if the suspicion of multiple sclerosis were entertained in doubtful cases, those cases faithfully followed and repeatedly examined and means taken to verify the diagnosis post-mortem, the disease would assume the position of importance which there is much evidence to show it demands in this country as in Europe.

DIAGNOSIS AND PROGNOSIS.

The diagnosis of multiple sclerosis is often absolutely impossible to make with assurance during life even in advanced stages of the disease. It is likewise possible that the diagnosis made relatively early in the disease may give place to another

as the process extends. A case, for example, was reported some years ago by Oppenheim,¹⁴ in which the diagnosis of multiple sclerosis was definitely made and was later changed to another up to within a short time of the patient's death. The autopsy revealed typical multiple sclerosis. Spasticity was a predominant element in this case. This error is no doubt at times made and quite unavoidably. It has also been conclusively shown, through the careful researches of Hoffman and Müller, that upwards of twenty affections of the nervous system may be mistaken for multiple sclerosis. If this be so, and there is absolutely no reason to doubt it, it follows that a definite diagnosis in a large proportion of the cases cannot be made. Hence no doubt our fallacious statistics. Müller devotes one hundred pages of his book to the diagnosis and the differential diagnosis with exhaustive literature references. The interested reader may be referred to these pages for a discussion of the difficulties. The situation in this disease is a peculiar one and extremely likely to lead to error inasmuch as a so-called typical case of multiple sclerosis, such as for example, our Case VI, is one of the most unmistakable diseases of the nervous system, the diagnosis of which may easily be made at sight or with the simplest sort of physical examination. Contrasted with this are the atypical cases, which we are gradually coming to learn constitute by far the larger proportion, and between the extremes there are naturally a vast variety of transitional forms, in many of which the diagnosis can by no possibility be made and in others only with probability.

Charcot's service was to map out a definite clinical picture and to lay stress upon certain predominant and characteristic symptoms. We have since learned that dependence upon scanning speech, nystagmus, and so-called intention tremor is fallacious in the extreme. These symptoms are at times absent throughout the entire course of the disease, and if the diagnosis is not to be made without the presence of one or more of them, we shall certainly continue to overlook many cases in the future as we have in the past. In 1898 Sachs in his critical digest stated that the diagnosis should only be made if the cardinal symptoms were present. This view has also in general been

¹⁴Oppenheim: Berlin. Klin. Woch., xxxiii., 184, 1896.

adhered to in the neurological clinic of the Massachusetts General Hospital with the result that up to within a short time the diagnosis rarely occurred in the records of the out-patient service, namely one in two thousand cases, as determined in 1902. This is evidently an erroneous standpoint; without question the diagnosis should often be entertained as the most probable in many cases in which these symptoms do not appear. Reference to the pathological anatomy of the disease renders this sufficiently obvious.

Charcot and his followers also drew attention to what have been termed "formes frustes," and it is to this large category that our special attention in the future should be paid. The field is still further widening by the recently expressed opinion that recovery may take place from multiple sclerosis, and that the well recognized intermissions of the disease may be of very long duration. Bramwell,¹⁵ for example, has recently published a paper on prognosis on the basis of one hundred and ten cases. Of these eight were more or less improved and four were regarded as well. Two of these latter cases are quoted at great length and others are referred to with apparent recovery or improvement. In one instance the disease lasted for thirty-three years, and in seven cases more than twenty years, with an average duration of upwards of ten years. Buzzard¹⁶ likewise has recently discussed remissions and relapses in disseminated sclerosis. It is apparent, therefore, that if observations such as those of Bramwell are correct, the diagnosis of the condition in its earlier stages is rendered still more difficult. While there is no inherent reason in the present state of our knowledge to deny the possibility of recovery, it is no doubt safer and more nearly in accord with facts to question the diagnosis in those cases which show definite and permanent tendencies toward improvement. Frequent confusion with hysterical conditions must not be lost sight of in the estimation of these cases.

Admitting the fact, which seems definitely established, that the disease may run its entire course without the appearance of any of the so-called cardinal symptoms, and that in the earlier stages they are very frequently absent, the question of the significance of other and subordinate signs becomes of increasing

¹⁵Bramwell: *Rev. of Neurol. and Psych.*, iii., 161, 1905.

¹⁶Buzzard: *Lancet*, ii., 131, 1904.

importance. Of these signs perhaps the greatest importance should be attached to unexplained spasticity. In my experience the pathological exaggeration of the deep reflexes is a practically constant finding in the disease. In fact, a spastic paraplegia may so far predominate the clinical picture as to give rise to the assumption that we are dealing with a primary degeneration of the pyramidal tracts, rare as that condition is. Dinkler,¹⁷ for example, has described a patient with spastic paralysis which remained dormant for eighteen years and then developed complete paraplegia, the autopsy showing sclerotic patches in both brain and cord. A spastic condition of the extremities should always suggest the possibility of multiple sclerosis, though such a sign alone is manifestly insufficient upon which to base a definite diagnosis. The value of this sign is naturally rendered decidedly less from the fact that it may occur in a great variety of conditions, but its frequency in multiple sclerosis should not on this account be overlooked. The diagnosis of ataxic paraplegia is no doubt not infrequently made in preference to multiple sclerosis when certain vague sensory symptoms are present. Such a diagnosis was made provisionally in two of our cases, afterwards shown by autopsy to be incorrect.

A second series of symptoms, neglected in spite of Uhthoff's work and the stimulus which that gave to more careful examinations of the eyes, is that relating to the general ocular conditions. It is not usual in our out-patient clinics to make routine examinations of visual fields or of the fundus, nor is transient diplopia given the attention it deserves in this connection. There is, however, no doubt that light might be thrown upon many obscure cases of multiple sclerosis were these examinations conscientiously made. A pallor of the temporal side of the optic disc, together with transient diplopia or alterations of the fields, if associated with spasticity of the extremities, should excite a strong suspicion of multiple sclerosis quite apart from nystagmus or the other cardinal signs. The age of onset, usually between the twentieth and fortieth year, is of some slight value in diagnosis. In spite of certain reported cases it appears altogether unlikely that the disease begins in childhood, and it is certainly extremely rare after the forty-fifth year. One of my patients, the diagnosis in

¹⁷Dinkler: *Deutsch. Ztschft. f. Nervenheilk.*, xxvi., 233, 1904.

this case was not made, had passed the fortieth year, and another was about forty when her first symptoms were observed. Heredity plays undoubtedly an exceedingly small part in the disease, although here again various cases have been reported which seem to bear out the theory of hereditary transmission.¹⁸ Müller lays much stress upon the absence of the abdominal reflexes and finally of the cremaster reflexes as significant in diagnosis. Since my attention was called to this observation, I have examined a number of cases with special reference to the abdominal reflexes and have in practically all cases found them absent. The uncertainty, however, of this reflex, which Müller denies, makes it merely of subsidiary importance in the ultimate diagnosis. Apoplectiform attacks, vertigo, forced laughter and weeping, paresthesiæ, bladder disorders, and more definite disturbances of sensibility, may under certain combinations likewise be suggestive. The frequency, however, of these disturbances in many disorders of the nervous system reduces their value. Finally the mental symptoms, which according to a recent study by Geay¹⁹ may range all the way from a slight weakening of the memory to true conditions of dementia, must be accorded a place in the diagnosis. When all is said our dependence in this as in other diseases must be in a combination of symptoms leading to a clinical picture which a widening experience shows to be consistent with multiple sclerosis. At best the diagnosis is often impossible, but also not infrequently may be made with probability. To accomplish this end our examinations should be more detailed, we should continue to lay stress upon so-called cardinal symptoms, but more upon others almost equally important but far less conspicuous.

PATHOLOGICAL ANATOMY.

The etiology of the disease remains absolutely obscure. The supposition of a selective poison acting through the blood vessels is justified as an hypothesis, but remains undemonstrated as a

¹⁸Reynolds: Some cases of family disseminated sclerosis. *Brain*, xxvii., 163, 1904. Gill: A case of disseminated sclerosis of congenital origin. *Australas. Med. Gaz.*, xxiii., 158, 1904. Armand-Delille: *Symptômes de sclérose en plaques chez un enfant de 5 ans et demi*. *Rev. Neurolog.*, xiii., 243, 1905.

¹⁹Geay: *Thèse*. Lyon, 1904, pp. 966. See also Seiffer: *Ueber psychische, insbesondere Intelligenzstörungen bei multipler Sklerose*. *Arch. f. Psych.*, xl., 252, 1905.

fact. Our chief interest therefore, still centers, as it has for many years past, in the pathological anatomy of the condition, and in this field much interesting and important work has been done with a certain definite alteration of opinion regarding the character of the pathological process.

The lesions of multiple sclerosis are unique among pathological processes, both as regards their location, their method of growth, and their destructive qualities. The diversity of symptomatology

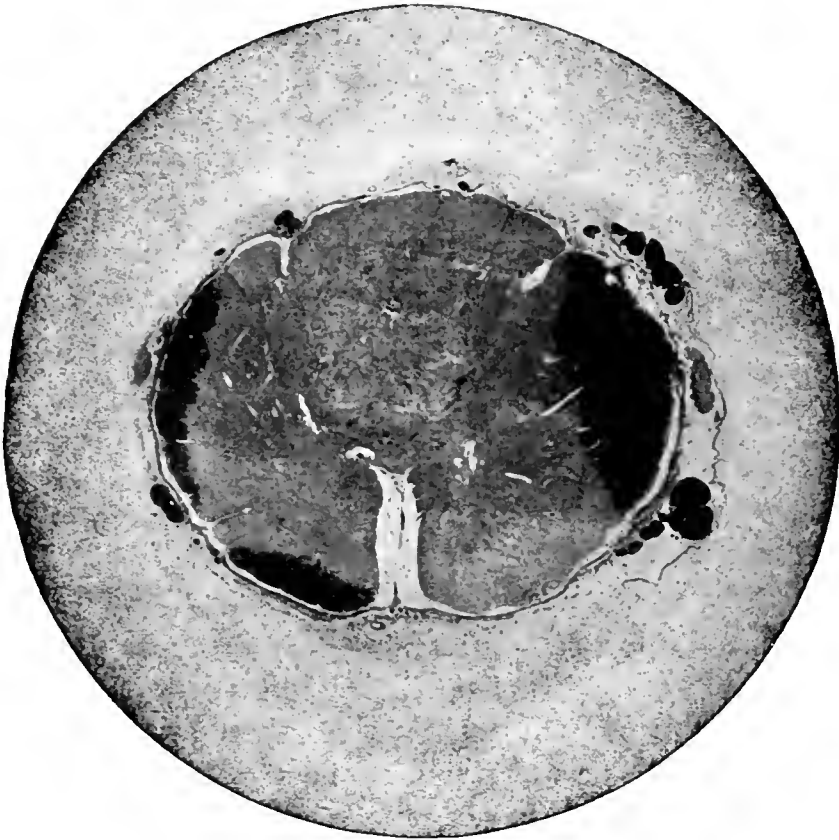


Fig. 1. Thoracic cord. Weigert stain. Sharp delimitation of sclerotic patch, which occupies nearly the entire cross-section.

is naturally and easily explained by the varied and irregular distribution of the sclerotic areas throughout the brain and cord. That true multiple sclerosis is a cerebrospinal disease remains on the whole undisputed, although Sachs very justly criticises the generalization from a few cases on this point. In two of the cases reported in this paper the lesions were largely limited to the spinal cord, but careful search throughout the brain showed their occurrence there also, and the evidence seems strong that in

cases which progress to a well defined stage lesions will usually be found widely disseminated both in brain and cord. The position of the lesions as regards their possible symmetrical distribution has also been much discussed. In the eight cases which I have had the opportunity of studying with more or less care I have entirely failed to discover such symmetry, except occasionally in what seemed to me a purely fortuitous way. Spiller, Burr, Müller, Zeigler, all maintain more or less symmetry of



Fig. 2. Lumbar cord. Weigert-Pal stain. Vague delimitation of sclerotic areas; the superficial character of the process is well illustrated by this specimen. Degeneration of dorsal nerve roots.

localization. Zeigler, for example, regards the dorsal columns as a place of predilection, and others are equally insistent regarding other locations. I find also no reason to change the opinion expressed in a previous paper that the gray and white matter are irrespectively involved, and that the predominance in the white over the gray seems to indicate what, in fact, does not exist. Lesions of the cerebral cortex I have frequently observed, likewise of the gray matter of the cord, essentially irrespective of

the white. In general, I have not been able to discover that the gray matter forms the slightest barrier to the progress of the disease, nor can one see on the expressed theories of the pathological process why any such limitation should exist.

The character of the individual lesions is a matter of considerable interest. The study of various cases demonstrates beyond question that the patches of sclerosis vary widely and that one or another type of lesion usually predominates in a given case, although various types may co-exist in the same case. I refer particularly to the sharply defined, clean cut lesions which are most frequently found as contrasted with a much more diffuse type in which the pathological area shades off into the normal and shows no sharp delimitation.

Whether or not these two types signify a fundamental difference in the process is undecided, but the fact of their occurrence in different cases is worthy of more attention than has been given to it. Although the clean-cut line of demarcation between normal and pathological tissue is no doubt less sharp than certain methods of staining (*e. g.*, Weigert myeline sheath method) would lead one to suppose, this does not militate against the fact that the degree of demarcation is greater in one type of lesion than in the other and must demand a somewhat different explanation. The clinical bearing, if it have any, of this fact, is not clear, but it is nevertheless important to draw attention to the differing reaction of the neuroglia and of the myeline in the two types of sclerotic patch.

A further type of sclerotic patch of interest in this connection is illustrated by the accompanying photograph taken from Case II.

It will here be seen that the general type of lesion is clean cut as against the surrounding myeline, but that there are, as it were, two superimposed lesions. The central portion of the degenerated area shows a practical entire absence of myeline. The edges of this are clean cut. Extending from this edge a much milder degree of degeneration is seen, which again is sharply circumscribed against the outlying normal area. Such a lesion as this is not particularly unusual, but is certainly of interest in view of the attempted explanation of the genesis of the lesions in general. To associate such a process as this with a local vascular disturbance is extremely difficult, except in the sense that blood vessels are the distributing agents of a selective poison.

Perhaps the most generally accepted theory of the pathological process is that of a multiple gliosis, with secondary destruction of myeline, sparing in great measure the axones and the nerve bodies. That the axones are preserved or at least are found in the sclerotic areas is definitely established. The clinical signs of disease, usual absence of muscular atrophy,²⁰ and preservation of function out of all proportion to the apparent extent of the

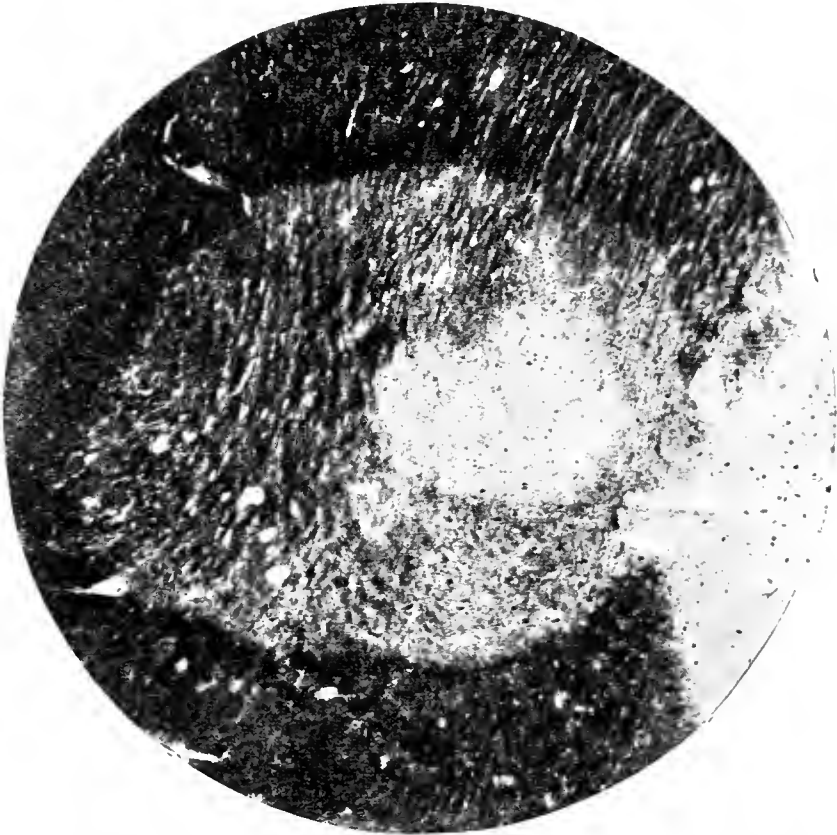


Fig. 3. Case II. Weigert stain, pons. Double sclerotic patch; deeply degenerated centre; less degenerated outer zone, both sharply demarcated, and having no visible relation to blood vessels.

pathological process, bear this out, quite apart from the histological appearances. The gliosis, if this be accepted as the essential lesion, is, therefore, non-destructive of the essential nerve parenchyma. The relation of this gliosis to blood vessels has been variously interpreted by different observers and apparently with equal assurance. For many years certain investigators have insisted upon the immediate relationship between blood vessels

²⁰Dercum and Gordon describe muscular atrophy in their recently reported case. *Am. Jour. Med. Sc.*, cxxix., 253, 1905.

and lesions, others have failed to see anything more than a coincidental connection, and still others have been wholly unable to demonstrate any histological relationship between them. A careful personal study of many hundred specimens has failed to show any distinct relationship between vessels and lesions. Such slight vessel changes as have been observed I have been inclined to consider insignificant, and it has been utterly impossible to bring extensive lesions, such for example as an entire transverse lesion of the cord, into accord with the vascular theory as ordinarily expressed. I am, therefore, still inclined to regard what vessel changes occur in relation to the sclerotic patches not as cause and effect, but rather as parts of a general process. It should furthermore be stated that in many cases vessel changes of any sort are not discoverable. This naturally does not preclude the theoretical possibility that the agent producing the lesions circulates in the blood and thence produces its effects.

The weight of the best opinion, nevertheless, is at present somewhat in favor of the significance of the blood vessels in the process. To this I shall revert later.

Admitting the generally accepted hypothesis that the lesions are essentially a multiple gliosis, however induced, it should be remembered that the essential argument, which to many no doubt is sufficient, in favor of this hypothesis is that neuroglia may easily be demonstrated by modern methods as the predominant type of tissue in the sclerotic areas.

From this fact it has been assumed that the process is primarily a neuroglial overgrowth. Of late, objections have been raised to this hypothesis on the following grounds: Neuroglia reacts in a similar way under no other conditions.. If it be not merely compensatory in its proliferation, it is destructive of myeline, axones and cells alike. In multiple sclerosis the neuroglia shows no such destructive tendencies, and for this there must be some explanation. It is difficult also to see on the theory of a primary gliosis why the edges of the sclerotic patches should be sharply defined. This means that proliferation is extensive up to a certain point and then very rapidly subsides, in contrast to its behavior in glioma, for example. The failure to form distinct tumors is also noteworthy if it be a primary neuroglial growth. The limitations of the process, in other words, as well as its extent demand explanation on this theory. Finally, the appear-

ance of sclerotic patches in nerve roots without evidence of any neuroglia proliferation, and probably in positions where neuroglia does not exist, is subversive of a theory of primary gliosis.

The reaction from this widely accepted theory, which is still held by many observers, among whom Müller may be mentioned, is of very great interest. In his valuable critical review of the status of the multiple sclerosis question, published in 1904, to which reference has been made, Borst sums up the newer points



Fig. 4. Case I. Phosphotungstic-acid hematoxylin stain. Overgrowth of neuroglia in the midst of a sclerotic patch, showing wavy arrangement of fibrils.

of view. He regards the blood vessels as important, and also the lymph vessels, in relation to the distribution of the sclerotic areas. The probable cause is stated to be a chemical substance with special destructive affinity for myeline. The process consists, first, in vessel changes, second, in a primary myeline degeneration, and third, neuroglia overgrowth. A primary glia overgrowth does not occur. Borst discusses from a theoretical standpoint the probable importance of the vessels and of the lymph channels

and admits the possibility of the development of multiple sclerosis from a myelitis, following Leyden.

Bielchowsky²¹ in 1903 published an important paper on the histology of the disease. He found by special methods of staining, as others had done before him, many axis cylinders persisting in the lesions, and advanced the somewhat unique idea that, although many of the axones were persistent, some at least were new formed. He found the vessels important in the topography of the lesions and drew an analogy to acute disseminated myelitis. He was inclined to regard multiple sclerosis as ultimately an inflammatory process pure and simple, which resulted in degenerations which were neither primarily parenchymatous nor primarily interstitial, but that both glia and nerve fibers were from the first involved, the nerve fibers in a more uniform way than the glia.

Writing in the same year Bartels²² made the observation that the fibrillæ of the axones were long preserved, but that the myeloaxostroma, described by Kaplan, and the myeline were lost probably through the action of some toxic agent which affected both. He also was of the opinion that a primary neuroglia overgrowth was not responsible for the patches of sclerosis. In the same year also Strähuber²³ published an important paper on the degeneration and proliferation processes in multiple sclerosis. He likewise found inflammatory lesions of the vessel walls, and regarded the cause as a toxemia working on a weakened nervous system from whatever cause. The significant feature of his work was that he found a wide-spread degeneration of axones as well as of myeline and advanced the definite theory that the persistent fibers in the sclerotic areas were new formed. This, he thought, better explained the well known failure of secondary degeneration in this disease than the supposition that the axones were preserved. To this both Bartels and Bielchowsky, except as occurring in an insignificant degree, dissent. A remarkable finding in one of Strähuber's cases was alterations in the sciatic nerve analogous to those found in the cord. He also found sclerotic areas in the dorsal nerve roots.

²¹Bielchowsky: *Neurolog. Ctb.*, xxii., 770, 1903.

²²Bartels: *Deutsche Ztschft. f. Nervenheilk.*, xxiv., 403, 1903, also *Neurolog. Ctb.*, March 1, 1904.

²³Strähuber: *Zeigler's Beiträge zur path Anat.*, etc., xxxiii., 409, 1903.

The important pathological questions as they now present themselves may therefore be summarized as follows:

First. Are the blood vessels important as causative agents of the sclerotic patches, and if so, how are they involved? Are we dealing with a true inflammation in the ordinary sense of the term? In the attempt to answer these questions it is perfectly fair to assume that the blood vessels do take part in the pathological process. It is, however, far from demonstrated that we are dealing with an inflammatory process in any ordinary acceptance of the term inflammation. Strähuber and others find true inflammatory lesions of the vessel walls which they regard as significant. If the lesions, however, are to be regarded as a direct result of this inflammation, we are certainly dealing with a manifestation of inflammatory action which is altogether unique and bears no histological resemblance whatever to recognized inflammatory processes as seen, for example, in encephalitis or poliomyelitis. The extent and character of the sclerotic patches, the predilection for the myeline and the general absence in the area affected of signs of inflammation, render the explanation of a primary inflammation altogether doubtful. Müller finds not the slightest sign of inflammatory reaction, and my own study, both in this series of cases and in those previously investigated, leads me to agree entirely in this conclusion. Whether a typical multiple sclerosis may be derived from an antecedent but distinct encephalitis is another question, and seems to have evidence in its favor. At a recent meeting of the Berlin Neurological Society, Oppenheim²⁴ discussed a case reported by Maas in which an original diagnosis by Oppenheim of encephalitis pontis was later changed to multiple sclerosis and verified by autopsy. Oppenheim was of the opinion that multiple sclerosis might develop from an encephalitis. This at once opens the question of the relationship between multiple sclerosis and recognized inflammatory processes, but does not help in the solution of the distinctive character of the primary lesions of multiple sclerosis. On the whole the evidence is at present insufficient to ally the various **forms of myelitis** with multiple sclerosis in any definite fashion. If the process be not a true inflammation, with demonstrable lesions in and about the vessel walls, it is nevertheless both

²⁴Oppenheim: *Neurolog. Ctb.*, May 16, 1905.

possible and probable that the agent, whatever it may be, which produces the lesions reaches the tissues through the blood or lymph channels. It is also perfectly conceivable that the manifestation of the toxic agent may occur without evidence of local inflammation. The delimitation of the process in the individual patches is suggestive of an agent which completely exhausts itself after spreading a certain distance from the central focus, much as water spreads over a surface from a given point. This explanation, in

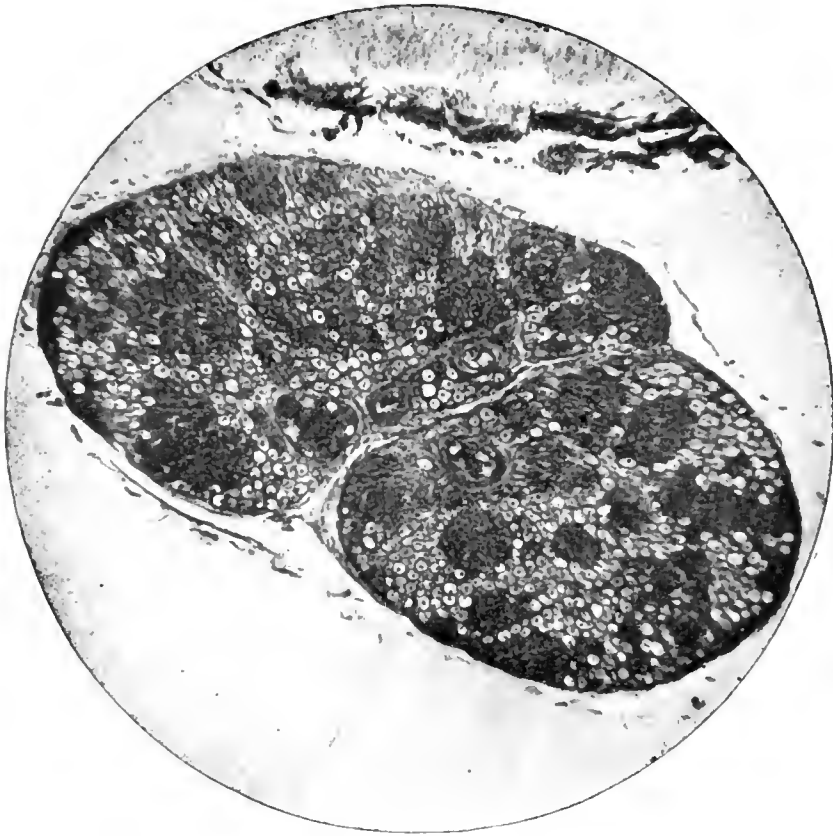


Fig. 5. Case IV. Ventral nerve root, thoracic region. Phosphotungstic-acid hematoxylin stain. Many discrete areas of sclerosis, irrespective of visible blood vessels; also many normal fibres, with sharply staining axones.

view of all the facts, seems far more reasonable than the hypothesis of a primary inflammation as that term is usually understood.

Second. Apart from the part played by the blood vessels, the essential point at issue is whether we are dealing with a primary overgrowth of neuroglia, with a primary degeneration of myeline, or a process which simultaneously affects both neuroglia and myeline. Arguments against the primary overgrowth of neuroglia long accepted are certainly accumulating in weight. The

character of the lesions as already discussed, the frequent lack of evidence of extensive proliferation of neuroglia, the fact that nerve roots are often degenerated, and in certain instances in the form of discrete patches, and finally degeneration of peripheral nerves as described by Strähuber, render the neuroglia theory unlikely.

Histological examination of dorsal and ventral nerve roots in one of my cases stained both by the Weigert myeline sheath stain and phosphotungstic-acid hematoxylin shows a typical superficial disintegration of myeline, without evi-

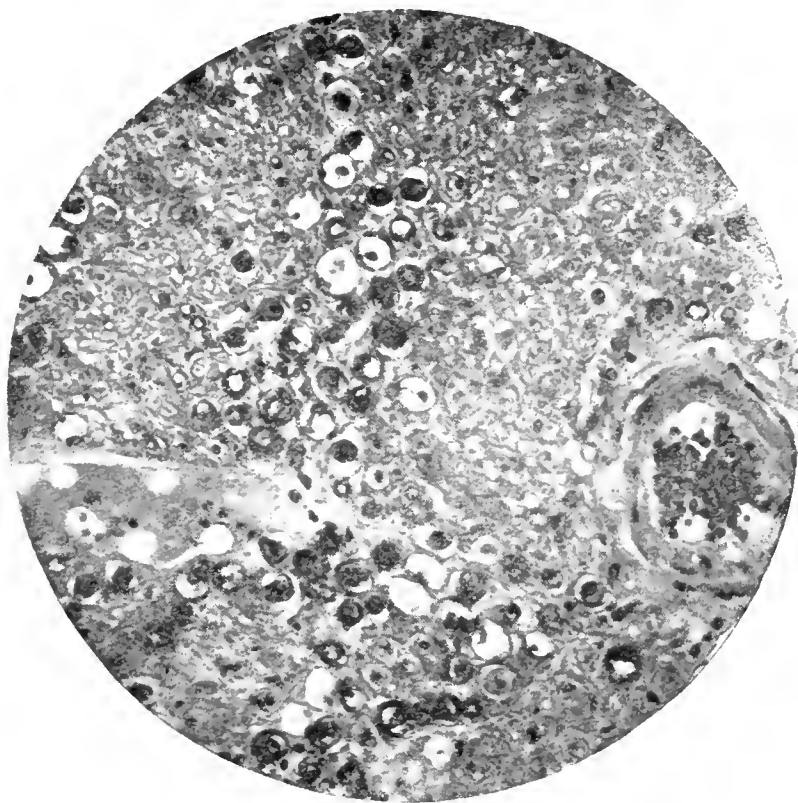


Fig. 6. Case IV. Weigert stain. Ventral nerve root, thoracic region. Stages in the degeneration of myeline. Blood vessel at the right.

dence of neuroglia perforation, and also without relation to visible blood vessels.

It is altogether unreasonable to suppose that such a degeneration as this can be due to primary neuroglia overgrowth, first, because no neuroglia is seen, and secondly, because neuroglia in quantity does not exist in nerve roots at a considerable distance, as in these sections, from the cord. Secondary degeneration could not explain the lesions of dorsal nerve roots, and the lesions of the dorsal roots were fully as conspicuous as those of the ventral

roots. (See figs. 6 and 7.) If Strähuber's observation of similar lesions in the sciatic nerve is correct, the primary role of neuroglia must be absolutely given up. A more probable explanation is that of a toxic agent of unknown character having a peculiar chemical affinity for myeline, and possibly also for certain analogous material in the axone. A third alternative is a simultaneous action of the supposed toxic agent upon the myeline and the neuroglia, leading in the one case, to a destruction of the myeline, and coincidentally, acting as a stimulus to neuroglia proliferation.

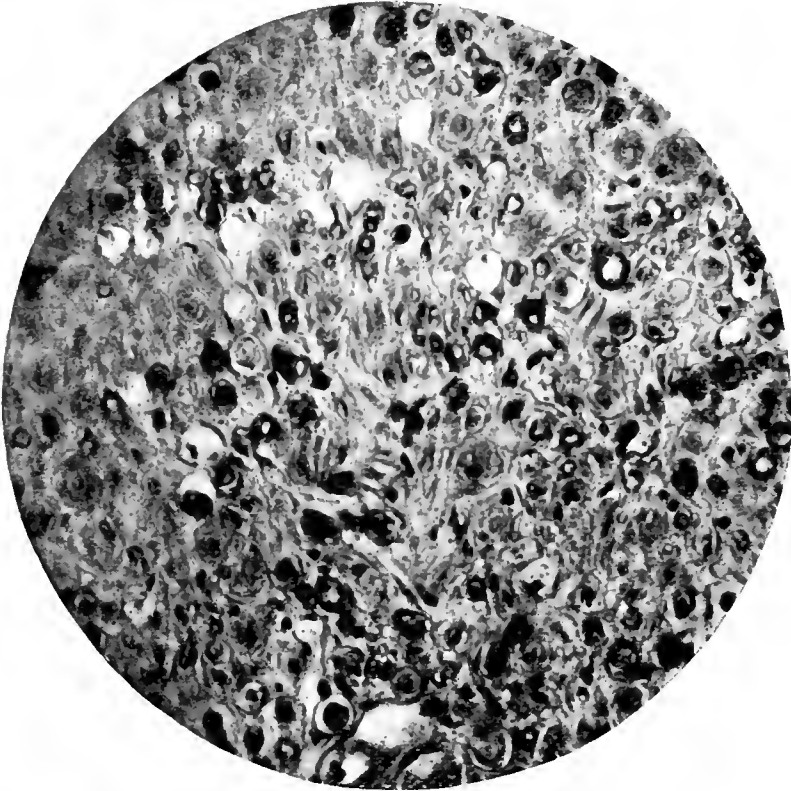


Fig. 7. Case IV. Weigert stain. Dorsal nerve root, thoracic region. Extensive myeline degeneration.

The sequence of events is, however, impossible to determine with accuracy.

Third. The question of the regeneration of nerve fibers in the sclerotic patches as explanatory of the existence of axones is on the clinical side not necessary to explain the symptoms, and on the pathological side has not been demonstrated with sufficient definiteness to demand unqualified recognition. The known lack of tendency on the part of central fibers to regenerate, as demonstrated both experimentally and clinically renders this assumption, in the absence of absolute demonstration, unlikely.

The general conclusions to which attention should be directed are as follows:

The rarity of the disease in this country has been over-estimated. A more careful examination of atypical cases and a more open mind in diagnosis is desirable.

The importance of observing and properly estimating minor symptoms of the disease, particularly unexplained spasticity and ocular disorders, must be emphasized.

The etiology remains obscure. The pathological anatomy is still a hopeful field for study. Present evidence points towards a primary destruction of the myeline with either a secondary or coincident proliferation of the neuroglia.

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SUBCORTICAL CEREBRAL GUMMA ACCURATELY LOCALIZED IN THE COMATOSE STATE; DEATH; AUTOPSY.*

BY GEORGE A. MOLEEN, M.D.,

OF DENVER, COLORADO.

The subject of brain tumor and the localization has long been a favorite one, not to say a "hobby of the neurologist," and the accurate finding and removal of tumor a dream which our forefathers, of not very long ago, had never had, and an accomplishment which is justly a pride to the modern physician.

That a tumor may develop to considerable size, particularly in the subcortex, underlying the motor area, and that it may exert pressure from below upon the cortex without seriously inconveniencing the individual or making itself manifest to the casual observer, does not seem to be fully appreciated. Indeed, few would be content to make a diagnosis of tumor of the brain without a majority of those so-called classic symptoms, vertigo, cerebral nausea and vomiting, headache, paralysis or paresis, sensory disturbance and optic neuritis.

Yet cases do occur, and not infrequently, in which there has been for a long time only an occasional headache, slight attacks of vomiting associated with numb and tingling sensations, which are looked upon as neurasthenic or hysterical. Mills, in 1900, in a report of a case of this kind, states in this regard: "It cannot be doubted that much in the history of the case and many of the symptoms pointed to the diagnosis of grave hysteria. Among these symptoms were unilateral hyperesthesia to touch, pain and temperature; persistent contraction of the fields for form and color, irregular color reversals, and frequently recurring states of emotional depression and excitement. When these were added to the fact that the ataxia and paresis vacillated considerably until a late period before the operation, and that the optic neuritis and the other general symptoms of brain tumor were absent or subordinate, it will be seen that many reasons existed either for the diagnosis of hysteria or for holding in balance the diagnosis between organic and functional disease." The tumor referred to was an endothelioma, subcortical, in the superior parietal convolution and was successfully re-

*Read at the meeting of the Colorado State Medical Society, Colorado Springs, Col., Oct. 2, 3, 4 and 5, 1905.

moved by Dr. Keen. The patient had suffered from nervous symptoms for from eight to ten years.

So also with the case I have the pleasure of reporting. After reviewing the clinical notes and the meagre history obtainable only through the relatives on account of the profound coma which had supervened when first observed, the attempt will be made to show that she had probably been afflicted with an intracranial growth for some time, if not from childhood.

E. A., a woman of thirty-three, single, was first seen May 12, 1905. She was born in Illinois and had been in Colorado some ten or twelve years, and of late had been occupied as a waitress.

Family history: Mother living, in good health. Father died of typhoid, and five sisters are dead from the following causes: some infantile disease, accident, confinement, accidental poisoning and septicemia. Chronic diseases, including tuberculosis, tumor, cancer, kidney, heart and nervous and mental diseases, are denied, as is also any knowledge of acquired syphilis and gonorrhea.

Previous history: As a child, had scarlet fever at thirteen, measles as an adult, and is stated to have been well until nine years ago, when she had mountain fever. Menstruated first at seventeen with considerable difficulty, and has been irregular ever since. She has always had severe headaches since childhood, at the height of which she would vomit, becoming nauseated at the time. Last summer she complained of her right leg and arm becoming weak and numb, and is known to have often had attacks of this kind.

Her sister states that she had for some time remarked that she could not see objects from the outer side of her right eye; that anyone coming up behind her and passing on the right side could not be seen without turning the head.

Present attack: On the morning of May 6 the right leg became very rigid and the arm limp, and in this condition she went about the house attending to her duties for the following four hours, during which time she became unable to speak. The last intelligible speech was "I can't talk," on the first day. She vomited a good deal on the 8th, and while she ate considerable since, including a hard boiled egg, she has up to the present vomited very little. From this time she became drowsy, and this drowsiness increased very gradually. On May 10 she dressed herself and went to the train to come to this city (Denver). The right leg is stated to have been very rigid, and the arm alternately rigid and flaccid. The left side was not noticed

to have been affected, though the mouth was observed to be drawn to one side, supposedly to the left, although this is uncertain. The drowsiness deepened while she was en route, and she was quite comatose when her destination was reached. She was seen a few hours after her arrival, when the following notes were taken:

She lies in bed unable to be roused, with the mouth slightly drawn to the left side. The musculature of the right half of the body is in a state of tonic contraction, which is more particularly noticeable on attempting passive motion. The same is true of the left side, but not nearly to the same degree. Owing to the fixation of the face and jaw muscles, the tongue cannot be seen; there is, however, no "grinding" of the teeth. The abdomen is decidedly scaphoid. The skin is moist and warm to the hand, and there is no perceptible difference on the two sides. The temperature per axilla is 100.2-5, and is from 1.5 to 2.5 higher on the right side. Pulse 60 and regular, though compressible.

The breathing is for the most part costal, up and down in character, but at times Cheyne-Stokes.

She moves all four extremities, those of the left side more than those of the right. Pricking the limbs is followed by motion, which is noticeably delayed on the right side.

The eyes are partly open and the lids seemingly paretic; there is no response on touching the conjunctivæ. The eyeballs are almost fixed, and the left is rotated outward. The right pupil is $2\frac{1}{2}$ mm. and the left $3\frac{1}{2}$ mm. in diameter, and are little, if at all, influenced by light.

The urine and feces are passed involuntarily.

Reflexes: Knee-jerks, R. decidedly increased; L. same, and seemingly more than the right, and there is a slight attempt at a clonus of the extensors on tapping the patellar tendon. Tapping the shaft of either tibia is followed by a decided extension of the leg. Both feet are in a constant position of equino-varus, with hyperextension of the toes. The deep reflexes of the forearm are markedly increased on both sides, but are very difficult to elicit on account of the rigidity induced in response to the slightest touch. Tapping the styloid process of the radius is promptly followed by active flexion in each arm. The pectoral and deltoid muscles respond actively and equally on the two sides.

Superficial reflexes: Plantar, R. present, and on stroking the sole of the foot there is a marked extension of the great toe, accompanied by a very slight extension of the small toes and with some separation. There is no perceptible difference on the left side. On tapping the dorsum of the foot there is to be seen only an attempt at extension of the second toe.

Lower abdominal, R. absent, L. same, and the epigastric reflex is absent.

Eyes: As before stated, there is apparently ptosis, bilateral, and the conjunctivæ are irritated from exposure. The eyes are fixed and no nystagmoid movement is to be seen. The left eye is rotated outward, and apparently to the extent of 5 to 6 mm. Neither pupil responds to light. The left disc cannot be outlined, is hazy in appearance, and the vessels are very turgid and tortuous, though the swelling is seemingly slight. The right is still more difficult to see, owing to the smaller pupil, and what could be made out of the fundus, especially the tortuosity of the vessels and the hyperemia, was very much the same as in the left eye. Under the slight effect of cocain upon the pupil, the left disc might be said to suggest atrophy in its left half, while the nasal side is unquestionably more hyperemic and the outline certainly not so well defined.

May. 13. The breathing is decidedly more tranquil, and the up and down character has disappeared.

May 15. The muscles are relaxed and only become tense upon passive motion. The diaphragm is now used in breathing. The eyelids are noted to have been moved. She is made to swallow, with difficulty, butter with croton oil, which is later followed by several bowel movements.

May 16. There is a decided improvement in the general condition. Beef juice and other liquids placed upon the tongue are swallowed. There are no spasticities while at rest. There is frequently movement of the eyelids. The abdomen is more decidedly scaphoid.. No rigidity of the neck muscles can be felt. The mouth can only occasionally be forced open, when the tongue can be made to respond to stimulation as before mentioned by placing liquids thereon. There is seemingly more motion on the right than on the left side of the face. She lies quietly, breathing easily, and with little or no motion of the hands, though the feet are occasionally drawn upward. When placed on her side the upper limb is the one moved. She coughs occasionally, as if attempting to clear the throat. The lung and heart sounds are clear, and no edema is to be observed in any part of the body.

No change in her condition is recorded from this time until her death May 17, at 3 p.m., except a gradual weakening of the pulse, a few slight spasms or twitchings and the rise in temperature, the last reaching 105 per axilla at death.

Clinical diagnosis: Gumma, of long standing, situated in the corona radiata immediately above the insula and below the arm area in the cortex, with secondary softening, with a basal meningitis and probably with multiple recent plaques or gummatous inflammation at the base.

This diagnosis seemed to best coincide with the following

facts: Headache, the importance or significance of which, however, was lessened from the fact that it had existed since childhood, and that recent attacks were no more severe than those experienced before. When, however, it was learned, after the arrival of the mother, that the father had had a skin disease for which he went to Hot Springs prior to the birth of the children, much more weight could be attached to the presence of this symptom. The history of weakness and twitchings in the right arm, and what was undoubtedly a right homonymous hemianopsia, certainly pointed to mischief in the left hemisphere, and this was strengthened when the motor aphasia, comparatively slow in onset, had supervened, inasmuch as she was known to have been right-handed. The gradual onset of the coma accompanied by rigidity, would suggest either the corpus callosum or the ventricle, while the slight rigidity of the posterior neck muscles, and the fact that it disappeared under mercurial treatment together with the ocular deviation, led to the suspicion of a basal meningitis of syphilitic origin.

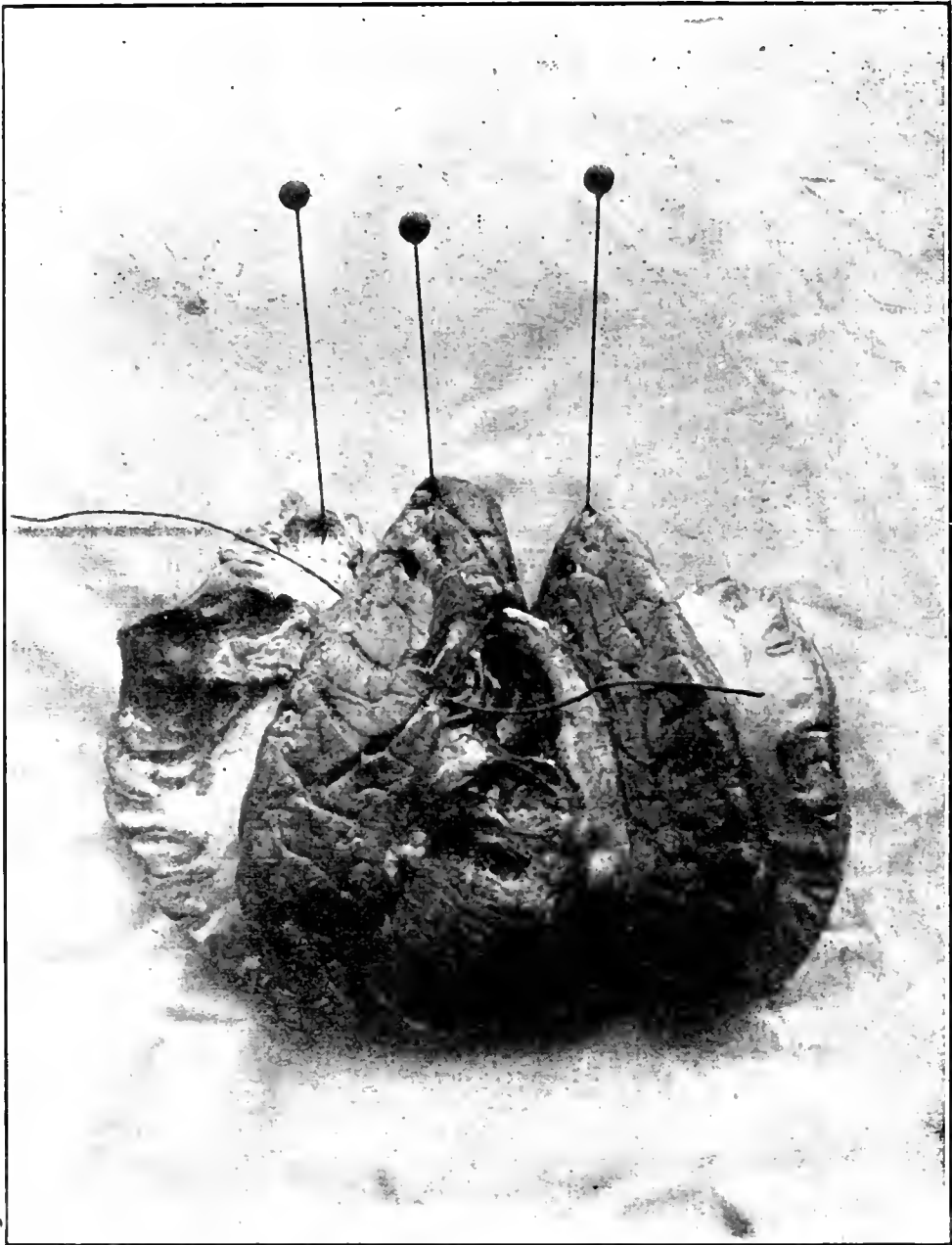
Autopsy: Unfortunately, consent to a post-mortem examination could not be obtained until three days after death. Mention will be made only of those points bearing upon the localization and the character of the tumor, and the evidence of the subsequent softening.

Upon opening the calvarium the membranes were found to be not adherent.

A marked depression was to be seen within the motor area, which measured about 7 to 8 centimeters in diameter. Anteroposteriorly, the greatest diameter lies between the second frontal convolution in front and the superior parietal behind. On the mesial surface the cortex is depressed at about the paracentral lobule. The membranes were not adherent over these areas, and the cortex shows no difference to the naked eye when compared with the opposite side. The basal ganglia and the vessels at the base are bathed in a yellowish white exudate, gelatinous in consistence, and there are numerous adhesions to be seen. After separating the two hemispheres, the right ventricle was opened through the corpus callosum and found to contain an opaque yellowish fluid, while the left was filled with a heavy, green and extremely offensive pus. An incision was next made through the left hemisphere parallel to the superior longitudinal sinus and through the greatest diameter of the depression, which disclosed an abscess cavity, the base and sides of which presented a hard, cartilage-like border. The roof, or cortex, was soft and about 3 mm. in thickness. The indurated wall was from 3 to 6 mm. in thickness, and showed numerous small blood vessels filled with blood clots.

The cavity communicated with the lateral ventricle by means of an opening which was large enough to admit the tip of one's little finger, and seemed to perforate under the corpus callosum.

From what has been said in this brief résumé of the au-



Gumma, Subcortical. Showing the Depression on the Mesial Surface at the Paracentral Lobule and the Cord Passing Through the Rupture Into the Lateral Ventricle.

topsy there can be but little doubt as to the character of the growth, and when to this is added the diffuse gummatous meningo-encephalitis which appears as a gelatinous mass, likened by Oppenheim to collodion, and which, according to Huebner, "often

disappears under treatment leaving a fibrous cicatrix which resembles chronic pachymeningitis," the doubt becomes slight.

A very pertinent question at this time is "How long has this growth existed?" Upon this we can but speculate, though it would seem that with the probability of congenital syphilis, the attacks of headache and vomiting dating back to childhood, its inception at this time can justly be suspicioned, which is in turn strengthened by the evidence of the sister with reference to the blindness of the right field.

Deserving of mention is a peculiar feature of the coma presented by this case. In attempting to rouse the patient by calling, shaking or by motion sufficiently active to awaken a conscious person an entirely different phase was excited; movement of the limbs, rigidity to passive motion, change in the character of breathing, sometimes accompanied by an audible voice sound with expiration, and acceleration of the pulse would be induced, while if left alone the rigidity would relax, except in the feet; the motion ceasing, she would pass into a quiet, tranquil sleep. If then the arm were cautiously elevated and released it would drop to the side, and if this was repeated a sufficient number of times she could again be awakened, as it were, for it seemed to the observer to admit of the paradoxical expression "a sleeping and a wakened state of the unconscious." While at present, to my knowledge, no importance can be attached to this phenomenon, yet it was so striking, and may later prove an aid in the study of the comatose states, if not in localization, that one cannot refrain from mentioning it at this time, and particularly since the peculiarities of sleep in cases of cerebral tumor have been recently studied by Franceschi, in which the nature and causes of what he terms pathological sleep are taken up. He describes the appearance of a continuous and tranquil sleep, though he makes no mention of the changes which have been noted above in attempting to arouse the sleeper. It may be that the explanation offered by him will apply to this case; assuming as most reasonable that sleep is produced by anemia of the cerebral cortex, this is taken to coincide with the fact that pathological sleep is most frequently observed in tumors of the optic thalami, hypophysis and the floor of the third ventricle, and as such, interfere with the circulation of the brain by pressure upon the circle of Willis.

Since it is the purpose of this report to show that tumors, and especially syphilitic gummata, may exist for a long time in certain localities of the brain, and probably lie dormant to suddenly become active by increase in size, or, as in this case, soften, suppurate and rupture with the irremedial result, and which prior to the time of activity give but little evidence of its presence, there is but little to add in conclusion.

While the early or rapid diagnosis of cerebral tumor is often of great moment, yet conservatism is the better course even in those considered operable, though for want of reasonable certainty, lives should not be jeopardized by operative interference; on the other hand, the diagnosis of neurasthenia should be made with extreme caution, if at all, in the presence of a single organic brain symptom.

A FURTHER CONTRIBUTION TO THE STUDY OF THE "PARADOXIC REFLEX."

BY ALFRED GORDON, M.D.,
OF PHILADELPHIA,

CHIEF OF THE NEUROLOGIC CLINIC, JEFFERSON MEDICAL COLLEGE; EXAMINER OF
THE INSANE, PHILADELPHIA GENERAL HOSPITAL; NEUROLOGIST
TO DOUGLASS MEMORIAL HOSPITAL.*

In October 1904 (*American Medicine*, Dec. 3, 1904, p. 971 and *JOURNAL OF NERVOUS AND MENTAL DISEASE*, Feb. 1905, p. 123) I demonstrated before this Society a new reflex to which I gave the name "paradoxical flexor reflex." I then presented my observations of 30 organic cases in which this reflex was evident. I found it always associated with other symptoms characteristic of involvement of the motor tract, viz., exaggerated knee-jerks, ankle-clonus and *sometimes* with Babinski's sign. As to the latter, I observed then that in the majority of the cases there was a sort of antagonism between the paradoxical and the "phénomène des orteils:" while one was present, the other was absent. I have often stated that a great many functional and perfectly normal cases were examined by me and the paradoxical reflex could at *no time* be elicited.

Now I bring before you the result of my further observations on the subject. They embrace 58 cases of organic nervous diseases in which all the evidences pointed to an involvement of the motor tract. They are distributed as follows: transverse myelitis 15, amyotrophic lateral sclerosis 8, hemiplegia 20, Jacksonian epilepsy with paresis on the same side 6, one case of essential epilepsy, disseminated sclerosis 2, cerebro-spinal syphilis 6. As in 1904 I found here the paradoxical reflex present in all the 20 cases of hemiplegia, but more frequently on the non-paralyzed side than on the affected side: 15 to 10. In these 15 cases Babinski's sign was absent on the non-paralyzed side. As to the paralyzed side, when the Babinski sign was pronounced, the paradoxical reflex was absent, when mild the paradoxical reflex was present. The latter fact was observed in 8 cases out of 10.

The same observation as to the relation of Babinski's sign to the paradoxical reflex was made in amyotrophic lateral sclerosis and

*The paper was read and cases were exhibited at the December meeting of the Philadelphia Neurological Society.

disseminated sclerosis. In the cases of transverse myelitis the following peculiarity was noticed. Seven out of 15 cases came under my observation at the beginning of their affection. Two of them presented a history of exposure to cold, 5 were traumatic in origin. Here the antagonism between the two reflexes was very marked: at first Babinski's sign was absent on one or both sides and the paradoxical reflex was present; about two or three months later Babinski's sign made its appearance, the paradoxical reflex completely disappeared or was faintly present. However in two cases both reflexes remained permanently together. In one case of cerebro-spinal syphilis in which the spinal symptoms were the most conspicuous, an energetic mercurial treatment was instituted. The patient's mental functions, the ataxia and the sphincters improved considerably. The knee-jerks however remained markedly exaggerated, ankle-clonus was present on one side, but Babinski's sign disappeared on one side and was only slightly preserved on the other; the paradoxical reflex remained intact and was easily obtainable. The interesting and important observation upon which I lay special stress was that concerning the reflexes in cases of Jacksonian epilepsy. When the examination was made immediately or shortly after the attacks the knee-jerk was exaggerated and the paradoxical reflex was easily elicited in all the cases, while Babinski's sign was in some cases only slightly present (3) and in others (2) absent. In one case a boy of 12 was ill with typhoid fever. He then developed meningeal symptoms, during which he had an attack of epileptiform convulsions on the right side, which were followed by paralytic symptoms on the same side. I had an opportunity to examine the little patient twice at an interval of two weeks. On both occasions the right knee-jerk was markedly exaggerated, there was no ankle-clonus and no Babinski's sign but the paradoxical reflex was present and easily elicited. The patient recovered completely, the paralytic symptoms, the exaggerated knee-jerk and the paradoxical reflexes disappeared. I have at present under observation a middle aged woman suffering from essential epilepsy. Whenever I examine her immediately after an attack, both knee-jerks are greatly exaggerated and paradoxical reflex is inevitably present, but at no time I observed in her Babinski's sign.

An impartial analysis of all the facts observed leads to the following deductions. The paradoxical reflex is a valuable sign for

diagnostic purposes at the beginning of an organic affection showing that the motor tract is being *irritated*. As proof I offer at least the above cited facts of focal and essential epilepsy. While Babinski's sign is of inestimable value in cases of a well established *lesion* of the motor tract, the paradoxical reflex is a sign, to say the least, of a transient irritation or of a slight lesion of the same tract. The above mentioned antagonism between these two reflexes, also the presence of the paradoxical reflex on the non-paralyzed side in hemiplegia is a proof of my assertion. I hasten moreover to remark that while the "antagonism" was present in the majority of my cases, nevertheless in some both reflexes were present together and obtainable to the same extent.

As is well known, Oppenheim obtained extension of the toes by passing the handle of the percussion hammer along the inner border of the tibia. This phenomenon is known as "Oppenheim's reflex." Similarly to Babinski's sign, it is observed, according to the author, in diseases in which the motor tract is involved. Oppenheim's statement was verified and corroborated by some observers. It is not present in every case, but when it is present, it always accompanies other symptoms, as exaggerated knee-jerk, or Babinski's sign. The only obscure point about this reflex is its mechanism, as it is difficult to say whether the extension of the toes is due to the excitation of the skin along the inner border of the tibia or of the musculature of the vicinity. The paradoxical reflex is obtainable exclusively by deep pressure of the deep muscles of the calf of the leg, viz., the flexor muscles; the ends of the fingers must be placed directly upon the middle of the posterior aspect of the leg. It is, therefore, in my judgment, a distinct reflex and totally different from Oppenheim's or any other described. As some sceptical neurologists may not be entirely satisfied with the above mentioned distinction between the two reflexes, I made a statistical study of the relation of the paradoxical reflex to Oppenheim's reflex. It is remarkable that in a large number of my cases (41) Oppenheim's reflex could not be elicited at all, in some cases (5) it was present together with Babinski's sign and the paradoxical reflex; and in some cases (12) was absent when the paradoxical reflex was present. I endeavored to obtain Oppenheim's reflex in those cases of epilepsy in which the paradoxical reflex together with exaggerated knee-jerks was present immediately after the seizures, but the results were negative.

The two cases I have the pleasure to exhibit illustrate to the best possible advantage the relation of the two reflexes. One is a case of diplegia, in which the knee-jerks are exaggerated, ankle-clonus and Babinski's sign are present on both sides; Oppenheim's reflex is not obtainable, paradoxical reflex is easily elicited on both sides. The other case is one of cerebrospinal syphilis, in which the knee-jerks and ankle-clonus are markedly exaggerated on both sides, but there is no Oppenheim's reflex while the paradoxical reflex is distinct and easily obtainable on both sides.

In conclusion I will say that in my judgment the paradoxical reflex is a delicate sign which has its diagnostic value, if it is taken in the sense I attribute to it, viz., as a sign of irritation or early stage of a lesion of the motor tract. To elicit it requires a little experience and it will be frequently observed, if the rules laid down by me previously are strictly adhered to.

I may also add that a series of 150 normal cases and 55 cases of functional nervous diseases were examined with absolutely negative results.

Periscope

Deutsche Zeitschrift für Nervenheilkunde.

(Vol. 26, Nos. 1-2.)

1. Clinical Contribution to the Knowledge of Chronic Sulphurous Oxide Poisoning. BY KÖSTER.
2. The Behavior of Sensation in Lesions of the Cerebral Cortex. BY BONHOEFFER.
3. Neuropathological Considerations and Observations. BY BERNHART.
4. Three Cases of Hemiatrophy of the Tongue. BY LANDAU.
5. Ophthalmoplegic Migraine. BY KOLLARITS.
6. Diffuse Sarcomatosis of the Pia Mater of the Brain and Spinal Cord, with Characteristic Changes in the Cerebrospinal Fluid. BY RINDFLEISCH.
7. Exhaustion of the Spinal Cord (Friedreich's Disease and Relative Conditions). BY BING.

1. *Sulphurous Oxide Poisoning*.—Köster reports four cases of carbon bisulphide poisoning occurring in workers in a vulcanizing factory. The first patient, a girl of twenty-two, first noted symptoms after she had been working for two years. The legs became cold and weak; there was difficulty in walking; a heavy feeling in the head, and a sensation of intense cold in the feet. Later she had an attack resembling drunkenness, with emotional disturbance. The breath was offensive and there was a disagreeable odor to the skin. The pain sense in the hands was diminished; the patellar jerks were increased; there was bilateral peroneal paralysis, giving rise to the steppage gait, with reactions of degeneration in the peroneal muscles. The second case, a woman of twenty-three, had similar symptoms in the legs, diminished patellar reflexes; diminished electrical reactions in the extensors of the arms and legs. There was a distinct odor of carbon bisulphide from the mouth, loss of sensation to pain and touch in the third and fourth fingers of both hands, and areas of hypesthesia in the feet. The electrical reactions were diminished in all the muscles. The third case, a woman of twenty-one, has worked for two and a half years. She suffered first from headache, was emotional, and there was a tremor of the limbs which disappeared after two months absence from work. The knee jerks were exaggerated; there was diminution in the electrical reactions. The fourth case, a woman of twenty-three, had been exposed for one year and a quarter before symptoms developed. She had first headache; a feeling of drunkenness; the breath had a distinct odor of carbon bisulphide; there was great fatigue in walking, and a distinct Romberg's symptom. There was also increase in the reflexes with patellar and foot clonus, and diminished electrical reactions in all the muscles. Köster describes the symptoms, calling particular attention to the intoxication that indicates involvement of the cerebral hemispheres. The method by which carbon bisulphide is introduced into the system is probably inhalation. There appears to be a gradual development of the symptoms, indicating a summation of the toxic effects. There does not appear to be a particular predilection for the motor nerves of the extensor muscles of the arm; indeed, no part of the nervous system appears to be immune to the poison. There is also doubtless centric disturbance affecting particularly sensation. Köster combats energetically the idea that carbon bisulphide intoxication

produces merely trivial and temporary alteration in the nerves; he regards it as a severe form of poisoning.

2. *Sensations and the Cortex*.—Bonhoeffer reports a series of interesting cases. A man of twenty-four, as a result of epilepsy, had had an operation in which the pial veins in the middle part of the Rolandic region were tied. There was disturbance of the stereognostic sense, of the sense of localization, and improvement in the epilepsy. There was also slight disturbance of the touch and size perception. The second patient, a man of twenty-four, had an injury of the brain, with depressed fracture in the Rolandic region. There was paresis of the right hand and a sense of cold. The sense of touch and the stereognostic sense were good, but after the operation the sense of touch was impaired, and astereognosis was present. The third patient, a man of thirty, had an injury to the skull, causing a depression at the junction of the parietal and frontal bones. He had at first paralysis of the right side, with aphasia; later he recovered from this, but developed epilepsy. There was a sensation of cold in the right hand, some impairment of the sense of touch and pain localization, and very slight impairment of the stereognostic sense. The fourth case, a man of thirty-three, had a depression of the right parietal bone as a result of injury. The left hand showed motor deficiency and tremor. There was astereognosis, apparently due to the impaired movements of the thumb. The fifth case, a man of fifty-one, suddenly developed aphasia, with weakness of the right hand. There was complete astereognosis, loss of the muscular sense, some disturbance of the localization sense. In cortical lesions, therefore, it appears that sensation is usually disturbed in the distal portions of the thumbs. It may involve also certain fingers; often there is disturbance of the sense of localization, position, movement, and stereognostic sense. He discusses the nature of astereognosis, and also the benefits likely to be derived from operation, which he considers are not great if the brain is actually involved.

3. *Neuropathological Considerations*.—Bernhardt calls attention to some early publications of his own and of others, of cases of polyneuritis in which reactions of degeneration were found in the muscles not subject to paralysis. He also mentions some other curious cases he has observed and published, characterized by loss of electrical irritability of the nerves and muscles, with preservation of their functional power. In explanation of these conditions he suggests that under the influence of certain toxic processes the injury to the nerve fibre may remain limited to certain peculiar pathological changes that may be transient. The paper concludes with some considerations of the spinal neuritic form of progressive muscular atrophy.

4. *Hemiatrophy of Tongue*.—Landau reports the following cases: First, a man of thirty-six, who had had epileptic attacks for six years, developed atrophy of the right half of the tongue, with diminished electrical reactions in this portion. There was chronic tremor of the left leg. The left hand was slightly weaker than the right. The case is one of cerebral syphilis. Second, a man of twenty-three, ten months previously had had paresthesia in the right arm, followed by vertigo and right hemiparesis. There was difficulty in swallowing, and shortly after this he noticed atrophy of the right half of the tongue. There was no disturbance of taste or of the movements of the tongue, and the electrical reactions of its muscles were normal. A diagnosis was made of some disturbance of circulation in the internal capsule, probably a syphilitic endoarteritis, although no improvement was made as a result of anti-syphilitic treatment. Third case, a man of thirty-four, two and a half years before observation after exposure, had had severe pain in the back, followed by paraparesis, from which he recovered. Three months later there was left facial palsy with loss of speech. Later he again lost power in his legs. The left half of the tongue was atrophied, and there was partial reaction of degeneration in the left side of the face and tongue. The diagnosis in this case was diffi-

cult, but Landau believes that the lumbar enlargement of the spinal cord was affected, probably as a result of previous syphilitic meningomyelitis; that the roots in the upper portion of the spinal cord were also involved. He believes that hemiatrophy of the tongue is more frequently due to peripheral, than to central, lesions. Among the other manifestations of this unilateral disease of the tongue are thickening of the speech and tremor.

5. *Ophthalmoplegic Migraine*.—A girl of seventeen, at the age of seven, had attacks of intense pain located in the right eye and right forehead. The attacks often lasted for from ten days to two weeks. After the short attacks there were no further symptoms, but after the long attacks there was ptosis of the right eye. They occurred three or four times a year. The examination showed that after an attack there was hyperesthesia in the distribution of the right branch of the trigeminus, associated with amaurosis of the left eye, which sometimes lasted several weeks. There was paresis of the oculomotor nerve. Von Kollarits believes that there is an organic basis of ophthalmoplegic migraine. Why the attacks occurred without following palsy is difficult to explain, but possibly there is, adjacent to the seat of migraine pain, an area of nerve tissue poorly developed, that sometimes is involved, sometimes not, by the attack of migraine.

6. *Pia Sarcomatosis*.—After discussing the extraordinary variety of tumors of the meninges, Rindfleisch describes a case characterized by pain in the back, weakness and stiffness in the legs, with paroxysmal painful contractures. Later the weakness involved the arms. There was retention of urine, and partial incontinence of feces. There was atrophy of the muscles, and diminished perception of all forms of sensation. The patient was removed from observation before death. The diagnosis of multiple tumors of the meninges seemed to be confirmed by the lumbar puncture. Pressure was normal, the color of the fluid was dark brownish-yellow, the albumin was 2.4 per mille, and there were some white cells in the sediment. The second case, a girl of ten, had headache, vertigo, unsteady gait, and finally, convulsions. These were followed by blindness and vomiting, but the patient, in addition to the headache, had severe pain in the back. There was papillitis and finally death. Lumbar puncture showed a high intracerebral pressure. At the autopsy a small round celled sarcoma of the pia arachnoid of the brain and spinal cord was found. The third patient, a woman of twenty-one, had had syphilis three years previously. There were some symptoms of meningitis, with remission and then increased severity. The cerebrospinal fluid was under high pressure; it coagulated and contained large cells with a single pale nucleus. Later there was paralysis of the right side of the face, and continuation of the pain in the head and back. At the autopsy a delicate membrane was found covering the pia, which consisted of tumor tissue, apparently a vascular round-celled sarcoma. Rindfleisch believes that these three cases represent a form of sarcomatous meningitis. This disease is characterized by somewhat atypical signs of meningitis, a rather longer course than meningitis indicates, and a peculiar characteristic of the cerebrospinal fluid, which is often brownish-yellow in color, and in the one case carefully examined in this respect, contained cells which presumably were derived directly from the tumor. The diagnosis is difficult, and was not made certainly in any of the cases. The prognosis is, of course, fatal.

7. *Spinal Cord Exhaustion*.—Bing discusses the theories in regard to tabes, and believes that the theory of substitution or exhaustion furnishes the best solution, if we combine with it an electivity of specific noxious factors. He then discusses hereditary ataxia, which he considers is best explained by supposing a hyperplastic primary condition, and insufficient substitution of the material consumed by functional activity. The paper is purely theoretical.

J. SAHER (Philadelphia).

PERISCOPE

Rivista di Patologia nervosa e mentale

(April, 1905.)

1. Chronic Progressive Chorea. G. DADDI.
2. The Reflex of the Extensor Digitorum Communis. ARTURO MORSELLI.
3. Histopathological Researches on Paramyoclonus Multiplex. EDOARDO POGGIO.

1. *Progressive Chorea*.—The author reports two cases. One of the two cases had associated epilepsy. The histopathological findings were numerical diminution of the nervous elements of the cerebral cortex, greater in the frontal or psychomotor regions, the cells as well as the fibers and of greater interest than superficial strata; modifications of the cellular structure, increase of the neuroglia, vascular lesions referable to arteriosclerosis.

Both these cases were old people, and it is important to bear this fact in mind when interpreting the lesions. The condition should be differentiated from cerebral arteriosclerosis of the diffuse form, chronic subcortical encephalitis of Binswanger, and the cortical atrophy of Alzheimer. In the first alterations are diffuse, and in preference about the vessels, in the second they spare the superficial strata of the cortex, and in the third present diverse vascular changes, the damage being limited almost exclusively to the territory of the great arteries.

2. *Extensor Digitorum Communis Reflex*.—The author sums up his studies in the five following conclusions:

I. The reflex of the extensor communis digitorum is produced by percussion in special places, one is situated about three inches beneath the condyle of the humerus, another on the muscular mass at the epicondyle, and the third toward the middle of the forearm on an oblique base line drawn from the radius to the elbow. It is not due to a motor impulse of central origin, but is a phenomenon of muscular reaction, dependent on the tone and the tonic and trophic condition of the nervous centres. Its nature is confirmed as well by the fact of having divers points of excitation, as by the varieties of reaction to stimuli; its being weakened in diseases, its etiology explained by a dystrophic action on the muscle fibre, and finally its abolition in morbid conditions in which there is no anatomical alteration in the reflex arc.

II. In normal individuals it is constant. It manifests itself under the forms of extension of a finger, of the hand, and by associated movements. The movement is in all cases prompt, quick, ample, of short duration, and ceases quickly with a rapid return to the previous condition of the part. In children less than three years old it is not easily elicited. In old people it is most torpid.

III. In pathological states it is modified, presenting exaggeration, weakness and even abolition. In augmentation of the muscular tone is recognized the morbid condition by a greater extension of all the bony parts, and therefore also of those fingers that in normal man are moved with difficulty or extended slowly, the stimulus not being sufficient to make the corresponding movement. In diminution of tonicity all the movements are slow, torpid and irregular, scarcely noticeable. When hypotonus reaches a certain grade there is no extension of the fingers or the hand.

IV. In no nervous affection can the diverse intensity of the reflex be a differential sign; as for example, between tabes and alcoholic pseudo-tabes, as in traumatic or rheumatic neuritis and that from alcohol, since in the toxic form there exists a torpid reaction and weakness of the muscles, while in the others it is quick or exaggerated. In hysteria and in the hysterio-epileptic state is frequently found a greater excitability of the extensors, while in the epileptic state and in some neurasthenics the extension provoked is weakened and finally abolished.

V. In toxic cerebro-psychopathies from morphine and from alcohol (morphiomania, insanity and alcoholic pseudo-general paralysis), the re-

flex is torpid. On the contrary, it appears quick or exaggerated in dementia præcox (hebephrenia and catatonia) in progressive general paralysis, and in mania.

3. *Paramyoclonus Multiplex*.—A detailed histological description of the findings in a case dying at the age of sixty-nine, having suffered from myoclonia for twenty-five or thirty years.

WHITE.

Miscellany

PERIPHERAL OBLITERATING ARTERITIS AS A CAUSE OF TRIPLEGIA FOLLOWING HEMIPLEGIA AND PARAPLEGIA. Chas. W. Burr and C. D. Camp (The American Journal of the Medical Sciences, June, 1905).

This rare and interesting cause of paraplegia must be distinguished from that due to arteriosclerotic changes in the spinal cord. In these cases the spinal cord is normal, but an obliterating endarteritis and a degenerative neuritis is found in the lower extremities. It is part of a general arteriosclerosis. Histological examination of the brain and spinal cord of one of the cases reported showed no lesion sufficient to explain the paraplegia. There was, however, an intense arteriosclerosis of the posterior tibial arteries and almost complete degeneration of the posterior tibial nerves. For a long time before his death the patient had had a complete paraplegia with contractures. The other case reported showed a similar condition, developing in a patient who had a hemiplegia from cerebral thrombosis, the result being a triplegia. These cases are to be distinguished from those due to combined brain and cord disease such as is seen in cerebrospinal syphilis.

C. D. CAMP (Philadelphia).

TRAUMATIC NEUROSIS. C. Lombroso (Clin. Moderna, Vol. xi., Nos. 10 and 11).

The author considers traumatic neurosis as a specific disease somewhere between hysteria and neurasthenia on the one hand and hypochondriasis and melancholia on the other. It can be caused by physical and psychic trauma, even by the latter alone, as when it follows severe emotional strain. It is not always easy to decide as to the reality of the various symptoms which the patient alleges as present, as imposture and exaggeration are frequent in this disorder, especially as regards paralyses and pareses and the vague painful sensations often complained of. Lombroso approves of Mannkoff's method of examination in which continued pressure is made upon the alleged painful area. If the pain is real the pulse will increase in frequency. He also considers the myasthenic reaction of Flora a reliable sign of traumatic neurosis. In this the muscles which are affected cannot respond to prolonged faradic stimulation by tetanus, and only after some length of time recover that capability. He has also noted that often the temperature of the injured side is lower than that of the other.

JELLIFFE.

HYSTERIA. C. C. Hersman, Pittsburg, Pa. (Journal A. M. A., Nov. 11).

The author reports three cases, one of hysterical hyperpyrexia and two of motor (major) hysteria, one following a fright and the other a traumatism. In each there was only one set of muscles involved, in one the arm or leg and in the other the diaphragm. The attacks seemed to be unattended by fatigue, though violent and often of hours' duration, and attended with excessive perspiration. The cases suggest to him the following questions: Is there an irritating or paralyzing product formed within the cortical neurones? Is there an irritating body or product in the plasma bathing of the nerve cell? Is there an increase in the formation of cytotoxins? Is there a decrease in the elimination of the metabolic waste product?

CAMP.

BOOK REVIEWS

Ueber Chronische Alkoholpsychosen. VON DR. PAUL SCHROEDER, Assistant der Kgl. Psychiatrischen Klinik zu Breslau. Carl Marhold, Halle. P. Hoeber, New York. 1.80 mk.

To Magnus Huss, perhaps, more than to any other observer, is due the general conception of the many-sided picture that constitutes "chronic alcoholism." From the mental side it has become more and more evident that the continued use of alcoholic liquors may bring about serious psychotic states. The delimitation of delirium tremens and acute alcoholic hallucinosis among these states has become almost a commonplace of psychiatry.

In addition to these forms which share a favorable prognosis with other acute poisonous states due to alcohol, there are a great number of conditions which have been described by many observers, and which develop slowly and have an unfavorable outcome. The picturing of the symptomatology of these unfavorable forms has been attempted by a large number of observers, the author being one of the latest to subject them to critical analysis.

In a comparatively small monograph, 81 pages, he has given a historical and critical résumé of the development of our knowledge concerning some of the aspects of the chronic alcoholic psychoses, and in a very clear and precise manner has presented his views concerning the relationships between alcohol and the chronic paranoid states so often described as the natural consequences of prolonged drinking. That alcohol may be *sui generis* the cause of some of these conditions, the author does not deny, but he says the matter is not entirely settled, and he is disposed to doubt the etiological role of alcohol as the initial cause of many of these paranoid states. The monograph cannot fail to be of service, especially to those who are interested in conservative psychiatry. JELLIFFE.

NEUROTIC DISORDERS OF CHILDHOOD. BY B. K. RACHFORD, M.D., Professor of Diseases of Children, Medical College of Ohio, University of Cincinnati. E. B. Treat & Co., New York.

Rarely does the reviewer find a book in which the individual point of view of the author is so consistently and systematically kept before him as the basis for a logical explanation of the phenomena discussed as in the recent volume on the Neurotic Disorders of Childhood. This point of view is briefly summarized in the statement that the modifications in the course of nervous disorders which characterize the period of childhood are due to the deficiency of cell inhibition at this time of life.

The volume is divided into two parts. Part I. contains treatises upon the normal function of nerve cells, the physiological peculiarities of the nervous system during infancy and childhood, and the etiological factors favoring neuroses in the young.

Part II. is devoted to the consideration of individual neuroses. In this section the chapter given to migraine is particularly to be commended. It will be found a complete and competent treatment of the subject.

It is significant of a present trend of medical thought that considerable prominence is given to the power of suggestion in the management of hysterical patients. Again, under the treatment of epilepsy this point is touched upon, but contrary to what one would expect from the light of recent experience. The value of educational measures is almost entirely disregarded, whereas a distinct emphasis is placed upon the exhibition of the bromids.

Nevertheless, there is no doubt as to the genuine value of the work. It shows the result of careful and accurate observation and logical interpretation.

THE
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Nervous and Mental Disease

Original Articles

THE POSITION OF THE ATYPICAL CHILD.

BY WALDEMAR HEINRICH GROSZMANN.

With the advance of psychology and educational methods, scientists, especially educators, have begun to realize that a very appreciable fraction of children exists in our schools to-day whose educational needs are being overlooked under the usual public or private school régime. Although at all times it was recognized that an element of children existed which could not assimilate education of the ordinary kind, educators never realized the extent of these cases, knowing only patent ones of idiocy, epilepsy, etc. What appeared to be minor cases never arrested attention sufficiently to warrant a general investigation. It is practically only within the last five or six years that a fuller recognition of this condition of comparatively minor deviation has been observed. The realization comes as an awakening to most of us, the problem involved is gradually unfolding itself, and its solution lies at present largely in the fields of experiment and theory. Few, if any, grasp the entire significance attached to this condition, or have at their command the proper methods applicable to the child whose mental, moral, and physical condition is warped. As regards the most obvious cases, the imbecile, deaf and dumb, blind, etc., recognition is due for the splendid efforts that have been made and the results that have been obtained in their education. A firm foundation for further and broader application has been laid. But even here much is left unexplored and unexplained. Yet, surprising results have been shown with these most obvious but also most radical and inelastic cases. The field of usefulness is here restricted, both in the case of the educator and of the child, to a limited range of

possibilities. But for the mass of those whose difficulties are less patent, though no less real, practically nothing has been done, and yet here the possibilities are without limit. Data concerning them are scattered, and in the few individual cases on record, need sifting.

It is, therefore, essential that a clear and compact presentation of the results of practical and experimental work with exceptional children should be brought forth to indicate what has been done. From this a beginning can be made in establishing general deductions which will give the problem its proper value and place among the sciences. The truths to be found are bound to exert an influence upon our conceptions of education, psychology, sociology, and, ultimately, philosophy.

Such data, when given their proper value, should tend to throw new light upon the laws underlying what is generally thought to be "normal" development, by illustrating the more striking effects in pathological development. A more assured knowledge of those laws and their operations should give modern educational theories a sounder basis, and through adequate understanding and provision, expand the scope of their practical application to what is to-day recognized as the "exceptional" element. Such provision is, in the practical sense, imperative when we consider that in many schools no less than 10% of the total number of children are found to belong to this element. From the point of view of these children most of the educational theories in operation at present appear to be inadequate.

Before discussing the exceptional child it is essential that we know what the scientist considers the normal or typical child,—if that concept can be determined or expressed. When we speak of "typical" examples, we are using a very elastic relative term which is intimately associated with its opposite, "non-typical," and whose absolute isolation or differentiation from the other is impossible. There is no one whom we really can call "typical" without qualification. The term can be only loosely applied, and with the reservation that it cannot sustain the test of searching analysis. However, the term has its value in speaking broadly of masses.

The word "typical" is generally considered synonymous with "essential average." The ordinary or mean average is obtained from a compilation of similar data about individuals who are not

too widely different. From these the mean is determined. Yet, probably none or very few of these data are themselves coincident with this mean, but are a variation of greater or less degree from it. The essential average, therefore, designates a standard inclusive of a specific variation in each case depending upon the variation range of such data as cannot well be considered distinctly abnormal for the characteristic. If a characteristic falls within the limits of its essential average—the latter having been previously determined from similar data—it may be called typical.

The following tables from "The Growth of the Brain," by H. H. Donaldson, will indicate how such essential averages are established.

THE WEIGHT OF THE BRAIN IN MICROCEPHALICS.

(Condensed from Marchand.)

Groups.	241-500 grms.	501-800 grms.	801-1015 grms.
Males, average weight.....	349	651	954
Females, " ".....	299	621	912

Microcephalics show decidedly inferior mentality.

TABLE SHOWING THE CRANIAL CAPACITIES OCCURRING AMONG EMINENT MEN AND MURDERERS AS COMPARED WITH THOSE IN TWO GROUPS OF MODERN PARISIANS. ONE MEASURED BY BROCA, THE OTHER BY MANOUVRIER.

Cranial Capacity.	Modern Parisians.		Murderers.	Eminent Men.
In cubic centimeters.	70 (Broca)	110 (L.M.)	45 (L.M.)	35 (L.M.)
	%	%	%	%
From 1200—1300.....	—	1.8	—	—
" 1301—1400.....	10.4	10.0	8.9	2.9
" 1401—1500.....	14.3	21.8	17.8	2.9
" 1501—1600.....	46.7	30.0	33.3	17.2
" 1601—1700.....	16.9	17.4	17.8	34.2
" 1701—1800.....	6.5	14.5	13.3	34.2
" 1801—1900.....	5.2	4.5	6.7	8.6
Above 1900.....	—	—	2.2	—
Total	100.0	100.0	100.0	100.0
Average capacity....	1560 cc	1560 cc	1571 cc	1665 cc

From these and similar tables the following results are obtained:

THE NOMENCLATURE OF THE ENCEPHALON ACCORDING TO WEIGHT. WEIGHT IN GRAMMES. (TOPINARD.)

Classes.	Males.	Females.
Macrocephalic	From 1925—1701	From 1743—1501
Large	" 1700—1451	" 1500—1351

Medium	"	1450—1251	"	1350—1151
Small	"	1250—1001	"	1150—901
Microcephalic	"	1000—300	"	900—283

The majority of macrocephalics are mentally deficient.

Numerous phases of development of the same characteristic, or function, may exist, and yet, each may be normal and conform to some type. This development usually is the direct outgrowth of environment, and its strength is proportionate to the intensity of the outside influences. The miner, for example, develops his finger muscles so as to be able to take a firm hold upon his shovel, whereas the pianist develops the same muscles to adapt them to a fine differentiation of touch upon the keys. Both have reached a state of typical development for practically the same muscles, but each adapted to his environment. Neither of them needs to possess exceptional powers in adaptation, but simply to attain the degree of strength and proficiency that most of us would in a similar environment.

The typical child possesses a group of typical characteristics, —or in other words, may be said to be typical because it is the embodiment of an approximate aggregate of a large number of characteristics within their essential average limits. This more or less arbitrary method of determining the typical can be, of course, rarely applied properly, owing primarily to lack of intimate knowledge of a sufficiently large number of children. If it is superficially applied, it answers well enough in most practical cases. It simply serves as a basis for comparison, and in no way signifies that the majority of so-called "typical" children conform absolutely to the ranges of variation in the essential averages of all their characteristics.

There exist almost as many variations from the mean variation, within and without the specific range, as there are different people. The sum of the variations from the mean averages of all the characteristics constitutes the element of first importance which determines the "personal equation" in each individual. Thus, with this in mind we find that child study is of value only in so far as it attempts to gauge the place of *each individual* with respect to a group—both as a unit of a mass and as a distinct individual. Its scientific study is of little value if the aim is to learn how to teach the child to conform to tabulated, impersonal

results. It has a distinct value only when its deductions are reinforced by each child's unhampered expression. In fact, it means rather a study of the possibilities of variation from the average, and the circumstances leading to them, than the measurement of the extent of conformity. Child study is an *inductive* rather than a *deductive* science. True education, education of the individual, can never be reduced to the exact science some of our modern psychologists unfortunately would make it.

Exactly considered, few characteristics can be even partially isolated, analyzed, and referred to a type. Characteristics, each physical, mental, or moral in kind, are not distinctly isolable units, such as they appear to be, but are the major elements of compounds. This idea has its exact analogy in chemistry, for example. A chemical compound is classified according to its major element or elements. An analysis of its elements gives us its constituency, but that very analysis teaches us that, for instance, H_2O_2 is a hydrogen peroxid whenever found in that combination. No other molecular formation will answer the requirements. Under various conditions of heat, pressure, application, etc., it will manifest itself in various forms. There is no range of atomic or molecular variation within which any similar compound can be identified with H_2O_2 . Resemblances might be misleading to the novice, but not to the experienced chemist. Just so most characteristics are types unto themselves—compounds which have individual molecular constituencies which alone account for their appearance under various conditions of environment. No two of these have ever been found to be identical. They may belong to a general group containing a similar major element or group of elements, but beyond this extent similarity ceases. Variation indefinite is paramount. The essential average must allow a variation which in many cases nullifies the possibility or value of assignment to a type. Just as the value of a definition lies in the completeness with which characters of difference from the general class are expressed, so the value of gauging a characteristic lies in being able to determine how its manifestations differ from the general class and give to it thereby its individual meaning. What externally may indicate similarity may internally come from wholly different sources. We might be able to determine with some degree of accuracy what would be the typical sizes of the hands of men who are 25 years old.

5 ft. 8 in. tall, weigh 145 lbs., and are accustomed to living in this or that environment. We could, however, under no circumstances find out valuable general types of *nerve control*, *patience*, or *bravery* determined from the standpoint of condition or motive. That depends upon intimate interrelations of the physical, mental, and moral aspects, and these relations are seldom even approximately the same in any two individuals, or for that matter, in the same individual at different times.

Not only is it next to impossible to refer most characteristics definitely to a type, but it is impossible to draw general conclusions as to how far it is typical for the development of one characteristic to affect the development of others. The aspect of the general aggregate of which each characteristic is a part, depends upon the close interrelation of the constituents. Change in any one of them affects all the others. For example, insufficient or poor nutrition will affect the circulation, respiration, etc., whereas excellent respiration will largely overcome poor circulation, nutrition, etc. In each case all these processes are modified by a variation in one of them. In each case the result is transmitted throughout the general organism and becomes evident in all its manifestations. Vivid imagination and ready subjectivity affect sense impressions reaching the cortex. As a result we may have hallucinations. Again, an affectionate disposition modifies associations in such a manner that all actions, whether personal or observed in others, appear prompted by a spirit of kindness. A high sense of honor regulates not only the attitude towards its maintenance, but also affects the attitude towards justice, truth, love, etc. Dishonesty affects moral principles in general disastrously. These examples are clear cases of physical, mental, or moral modification and interrelation. Innumerable gradations of greater or less degree result from all modifying characteristics. These are themselves in turn modified by their own effect upon general consciousness. Not only do modifications in any one definite aspect of human existence affect all other phases of that particular aspect, but affect to a greater or less degree the phases of all aspects. In the examples given the modifications are not each limited to a physiologic, psychologic, or ethical effect, but upon analysis will be seen to have their effect upon all three. As a further illustration, let us, for instance, consider the modifications physical variations bring about in some mental character-

istic, such as memory. Such psychologists as James maintain that each one of us has a very definite physical limit for the development of the retentive power of memory. Beyond this rather undefined limit we are unable to go. Yet, each one of us has the power to develop this potential into kinetic form. The primary determining factor will not be this mental potential, but will, opportunity, and environment. The memory of one with presumably a splendid, though latent, retentive power may be inferior to that of another whose innate power is not as great, though developed approximately to its fullest extent. Unless this development is undertaken during the formative period the potential reduces itself very nearly to the habitual kinetic level. Thus it would appear that the exercise of the physical function serves as a factor, modified by environment, which limits the extent of the mental function.

We have another example in the early growth and development of the brain, where mental activity is an influential factor in physical growth. The nature and extent of the metabolic processes in the brain are influenced and heightened through mental work. This implies a distinct modification of digestive, respiratory, and vasomotor activities, with a further modification of their correlatives. Digestion and respiration are reduced, while vasomotor activity towards the brain is increased. Spiritual ripeness is augmented by increased association induced by increased mental activity.

Thus we see that the elasticity of the meaning of the word "typical" must be very considerable, and its use can be of value only for differentiating from the markedly "non-typical." It is imperative to clearly understand the possibilities of variation if we wish to study more particularly the field that lies *between* the "typical" and the "non-typical," and to appreciate the possibilities lying within it.

In brief, the typical embodies an approximate equilibrium of physical, mental, and moral development. In each particular case, degree of relation to variously chosen arbitrary essential averages establishes inclusion or exclusion from the typical. This gives rise to *extra* and *intra-typical gradations*.

A discussion of these brings us to the real subject of this paper—viz., *the position of the atypical child in the general groups of classification*. Heretofore it has been generally sup-

posed that every child belongs primarily either to the markedly typical or the markedly non-typical group. The determination was founded loosely upon the preponderance of so-called "normal" or "abnormal" characteristics. In case any characteristics appeared to deviate to a degree that, within the knowledge of the examiners, placed them outside the limits of their essential average, they were, without qualification, considered abnormal. It is due to this superficial, frequently erroneous judgment, that our state institutions harbor idiots and insane with criminals, deaf-mutes with incorrigibles, homeless and vagrant in the local lock-up, weak-minded in the schools, etc. The exceptional child of minor degree will, with maturity, usually become criminal or irresponsible, and will perhaps finally be consigned to one or more of these institutions unless carefully guarded at home. Judgment will be based upon external evidence rather than primary causes.

A broader and more comprehensive classification, one that has been endorsed by eminent scientists of Europe and elsewhere, has been formulated in recent years by Dr. M. P. E. Groszmann. It differentiates the extra and intra-typical groups into as distinct classes as is compatible for a generalized survey. A particular child will not therefore necessarily fit exclusively into any one of these classes, but may be an embodiment of the phenomena in two or more.

The following are the truly extra-typical classes forming the non-typical group.

1. *Congenitally Abnormal Children.* Idiots, feeble-minded, insane, criminals and moral perverts.

2. *Congenitally Defective Children.* Epileptics, blind, deaf-and-dumb, etc.

3. *Children of Rudimental Development.* The primitive type representing mental, moral, and social instincts and activities on the savage, barbarian, or generally uncivilized level.

4. *Children of Arrested Development.* a. Submerged classes. b. Pathological classes—born apparently normal, but having their development checked by: 1. Hereditary causes, manifesting themselves at certain developmental periods: 2 Disease, fright, etc.

Of these classes the first, that of the *congenitally abnormal children*, is the most obvious. The children comprising it deviate from the standard of human nature and structure. They are

to be found in the home, the prisons, and the various asylums devoted especially to care of some of them. They embody a distinctly degenerate form of animal existence. All give evidence of mental chaos. The idiots, feeble-minded, and insane show cerebral deviation or malformation which may date back to embryonic development or may be the maturation in later life of a formative weakness or tendency. Psychiatrists, such as Lombroso, consider the criminals born such, and not primarily the outgrowth of their environment, but the expression of their inborn tendencies. Moral perverts, or as some call them, psychical degenerates, who have drifted into the insane, criminal, or simply morally affected classes, are the outgrowth of the effect environment has had upon their dormant perverse tendencies. In the proper environment these tendencies may be overbalanced and finally eradicated in some directions by proper habituations and guidance from the earliest years. Absolute success even then is doubtful, it is true, but improvement in numerous directions is unquestionable. Temptations can be forestalled, transgressions minimized, and society, in a measure protected.

The second class, the *congenitally defective*, is also easily distinguished. The condition of these children is due to hereditary or to pathological fetal development. They show modified brain development, often with hypertrophy of visual, aural, or other cerebral areas. Their conceptual life is in many respects distinctly different from that of the normal person, being restricted and modified through loss of sense functions and impressions. In the case of the blind, for instance, conceptual life is shorn of visual concepts, and these can be replaced only by, let us say, *aural interpretations* of the visual concepts of others. The possibility and the extent of these it is impossible to determine, as we would ourselves first have to be blind in order to know and compare our past with our present concepts. Such visual and other substituted concepts as Helen Keller is reputed to have are, I fear, illusions, and are merely the mechanical repetition of the concepts which others have imparted to her, but for which she can never have an actual apperceptive basis. Our language in itself is full of all manner of expressions implying sensual concepts, and these she has learned abstractly to juggle into the formation of word pictures.

Children of rudimentary development, those comprising the

third class, are born with primitive instincts. As already stated they are, "the primitive type, representing mental, moral, and social instincts and activities on the savage, barbarian, or generally uncivilized level." Our tramps and gypsies show striking nomadic instincts, for example, and are an instance of this type.

The fourth class, comprised of *children of arrested development*, may be divided into two main sub-classes. The children of the *submerged* class cease their further development at or soon after birth. They grow imperfectly and are frequently beset with many diseases and malformations. The evolution of higher capacity is nil. They are the outcome of vitiated vitality of generations and are the last, or nearly the last, product in propagation. The *pathological class* is made up of children who were born apparently normal, but who had their development permanently checked by unforeseen obstacles. They are of two types. Of these the *first* is comprised of children whose development was checked by hereditary causes which manifested themselves at post-natal developmental periods, such as pre-puberty, puberty, or adolescence. They give evidence of inherent weakness or tendency. The *second* type is comprised of children whose development suddenly ceased owing to disease, fright, or some like agent. Such a shock may cause a cataclysmic maturation of an innate weakness, or may serve as the starting point for a speedy decline in mentality. Both the submerged and the pathological sub-classes, which make up the class of children of arrested development, are thus seen to contain only children who may have acquired their abnormality or defectiveness *after* birth.

The propagation of the non-typical members of society seems to follow the biological law of survival of the fittest. The stock constantly dies out, but the ranks are constantly renewed by fresh hosts from the homes of other families. It is, however, very unfortunate that idiots, feeble-minded, etc., propagate very readily, and unless regulated, their progeny threatens to become a severe burden upon society. Their death rate is high and they are usually short-lived. Yet, their existence implies a considerable outlay before extinction is reached.

We now come to the point of transition between the strictly non-typical and the strictly normal children. The typical group may be said to be composed of intra-typical classes in contra-

distinction to the extra-typical classes which make up the non-typical group. Besides the strictly normal, Dr. Groszmann has indentified two further classes, viz., the atypical and the pseudo-atypical, within the group of "typical" children. In making this classification Dr. Groszmann gave an essentially new and concise scientific meaning to the word "atypical," a word which had become obsolete in its original meaning.¹ This revision has been generally accepted by those scientists who are best qualified to make use of such a term. To quote his own explanation, "the term 'atypical children' (is suggested) to differentiate—on the one hand, from the lower strata of genuine defectiveness and abnormality, and on the other, from the so-called 'average,' 'ordinary,' 'typical' child. The term 'atypical' includes the backward child, it is true. But the term 'backward' is a very ambiguous and misleading one. A backward child is not necessarily a mentally deficient child; it may be simply slow and yet possess considerable mental power. And then the term 'atypical' also includes the unusually bright and precocious child. Some children who are termed bright are in reality over-stimulated, and many are in a chronic state of nervous exhaustion; others appear over-alert and hypersensitive, and will sooner or later succumb to the effect of over-pressure. The precocious child, which does not possess genuine virility and does not gain its exceptional mental power and grasp from an especially sound physical basis, is exhausting its store of nervous energy at an alarmingly rapid rate." Some educators, endeavoring to cope with the problem of the exceptional child have misconstrued and misapplied this term and thereby attempted to give it a looseness which its originator had sought to avoid.

With its true meaning in mind the following classification of "typical" children presents itself for examination:

5. *Atypical Children Proper.* a. Neurotic and neurasthenic children. Over-stimulation and precocity. Irritability. Tic. Fears and obsessions. Vaso-motor, trophic, and sensory disturbances. Defective inhibition.

b. Children of Retarded Development. Physical causes: Chronic catarrh, chronic difficulties of nutrition, serious visual

¹"Atypical—Not typical, without typical character, differing from the type, irregular." Standard Dictionary.

and aural difficulties, etc. Impaired conceptual ability due to retarded brain development.

6. *Pseudo-Atypical Children*. a. Children whose progress in school was hindered by

1. Change of schools:
2. Slower rate development:
3. Temporary illness:

4. Physical difficulties, such as lameness and deformity, slightly impaired hearing and vision, adenoid vegetations, etc.

b. Children of unusually rapid development, with genuine (pathological) precocity. c. Children who are difficult of management. Naughty, troublesome, spoiled children. d. Neglected children.

7. "*Average*," "*Ordinary*," "*Typical*" Children.

The first class of this group, the atypical, is composed of two sub-classes, the first containing the neurotic and neurasthenic children, and the second those of retarded development. The neurotic or neurasthenic child is beset by various forms of nervous impairment which hinder normal growth. In each case defective inhibition plays a very large part in preventing satisfactory development. Children of retarded development have their physical, mental, or moral virility impaired or restricted through their physical difficulties. Although development is retarded it is not *arrested*. The child gives evidence of a lack of equilibrium through weakness, and a slower or unequal rate of growth.

The children of the first sub-class of the pseudo-atypical group, those who outwardly appear dull or unresponsive, show inability to cope with or appreciate their environment to the extent of the average child of their age and condition because of interrupted or unsettled education. In the case of the premature child which is allowed to develop at the cost of its nervous energy, or of the child which it is difficult to manage, each gives evidence of the native environment, and its condition is largely the result of it. The neglected child is to be found in all conditions of life. It is the progeny of the rich who confide their children almost wholly into strangers' hands, of the middle classes who show favoritism to the exclusion of some, of the poor who cannot devote their energies to the education of their children, but spend them in toil. The neglected child is also to

be found in the schools. It is the child which has fallen behind in the race and which the teacher has failed to encourage to struggle against its momentary difficulties.

The distinction between the atypical and the pseudo-atypical is based rather upon degree than kind of difficulties. The origins are not alike, but the conditions are similar in their effect. The pseudo-atypical tends to become genuinely atypical, from which it is liable to approach more nearly to true abnormality, unless properly handled in time.

What constitutes the "average," "ordinary," or "typical" child has already been discussed.

It will be seen that this classification gives a survey of the entire range of child variation, and yet gives a distinct gradation of developmental phenomena within the two groups.

A further discussion of the genuinely atypical child can now be taken up more in detail than was possible in an analysis of the classification. Experience and experimental work with children of this kind has not yet reached a stage where tabulated results are obtainable—primarily because of the limited number of these children which have been studied. Such results are never at the command of the pioneer. They are the outgrowth of long and widespread experience of generations. Such work as has been done has, however, modified the educational methods employed in their cases. It is these modifications and adaptations which will largely concern us in the following pages.

Moral perverts, or psychical degenerates, those who through their earlier years have felt that their own peculiar ideas were becoming more and more at variance with those of the people about them, until finally their concepts and mental associations became illogical and absurd, in many ways approach more nearly the atypical condition than any other non-typical children during the first years of life. All of us during our younger years have felt within ourselves as though that which constitutes the Ego is of an exceptional character in our own particular case which destines us to play an exceptional and distinctly personal role in life. Some of us dream of an exceptionally great role in our chosen profession, others dream of their exceptional constitution of mind and body which places them above the plane of the ordinary mortal, even to a footing approaching the godly. In most of us our idealized ego is gradually shattered in later life and

we recognize a similar human origin and general fraternity. The moral pervert, however, subjects his inner life to peculiar warpings of mental and moral concepts derived from its environment and carries these fixed through life. At bottom such warpings are due to nervous and other physical difficulties. What appear to be inexplicable and irresistible promptings seize such a child to outrage the established order of a community. The action appears to be the effort of a confined spirit chafing under the restraint of obnoxious laws to assert its own individuality regardless of the judgment of others. The element of revenge against the imagined persecutors accentuates the desire to overstep even its own boundaries. The case of a boy of twelve, comes to mind, who could not resist slyly hitting or even seriously maltreating his companions for no apparent reason other than that it gave him keen delight to subject others to his power. Yet the boy knew that he himself would invariably be severely punished. These peculiar warpings and their effects are increased and made permanent in the usual environment of misunderstanding and ridicule in which they are forced to grow up. They are indeed, abnormal and as such not amenable to successful treatment for a restoration to the norm. In the earlier stages their condition is very similar to that of the atypical, the difference being rather one of degree than of kind of loss of equilibrium. It is seldom that anyone of the non-typical group can be redeemed by our present methods in education, medicine, or surgery, whereas *all* those within the typical group can be brought nearer to a uniform standard.

Atypical children give evidence of cerebral deviation, though of minor degree. Their development is a struggle between this abnormal potential and normal development. *The atypical condition is a transitive one, and seeks to become permanent either in the direction of abnormality or some degree of typicality.* It is the struggle between hereditary or acquired weakness and conditions of life. In case weakness is paramount, conditions of life will be modified accordingly. If the environment is strong enough to overcome weaknesses, then it will hold them in subjection until habitation and regulated growth will have overcome them. Success with these children will, then, be dependent in a large measure upon the strength of the environment.

The atypical child is an embodiment of numerous warped tendencies which continue to deviate from the average to the abnormal with increase in age. Its condition is either a direct result of neural weakness, as in the case of the neurotic and neurasthenic children, or is the outgrowth of physical difficulty and its effect upon the nervous system. All these children are nervous to a marked degree. To the casual observer this may not at times be evident, as the expressions of the nervous condition take many forms and are often masked by peculiar habits. With longer study and opportunity to observe the unrestrained reaction either to native environment or to unaccustomed situations the condition becomes apparent.

The home environment is the direct abettor of the child's peculiar growth. Traditional traits and points of view are imitated and adapted to perverted fancies. What in the adult may be the result of experience or condition, in the child, through lack of proper assimilation, takes the form of idiosyncracies. The atmosphere of the home is charged with a host of individual habits and attitudes, many of them excellent in their way, no doubt, but most of them erratic and peculiar. The fact must not be overlooked that in most instances the parents themselves of these children are in a condition which is several degrees nearer the atypical, or even the abnormal, than the typical. If they attempt to combat their child's condition they fail because their own attitude is irrational, or what is worse, inconsistent. However, most parents, of whatever kind, are commonly unconscious of the peculiarities their children exhibit because of their habituation to them. The incipient and constant deflection is for a long time unobserved. It is only after marked progress in the wrong direction has been accomplished that it is observed, and then it may be too late to employ such crude or false methods as most parents have at their command. For them to attempt to eradicate the child's condition is to further upset and aggravate it, so that it finds expression in other ways as well. They either attempt to surround their child with a degree of love by which they would shield it from contact with the world and thereby make it forever dependent upon such protection, or they misunderstand the child's attitude and seek to drive out by radical means the "evil spirit" prompting its condition. In the one case it becomes the spoiled pet which the parents fear to aggravate, in the other the

obstinate, but unhappy child, which may feel itself bound to resort to deceit in order to have some chance to gain a few liberties. Both methods are detrimental to its best development. Thus the home environment is a disintegrating one for this type of children. Whatever weakness or tendency exists is transformed into actual abnormal growth.

Many parents, especially those who would shield their child from contact with the world at large, resort to the employment of private tutors or send it to a private school, if their means permit. In this way, they hope to control the child's development. The educator must subject himself wholly to the judgment of the parent. Even though he were capable of doing a great deal for his charge—which he usually is not, because he has no training and experience in such cases—he is completely handicapped in his influence by the parents. It is usually what the parents desire that the child should *not* do. Just because the point of view in method is not changed, but remains stagnant, the results are destined to become less and less satisfactory. New application and healthy competition in study by contact with a wider world than that of the home or private school is necessary to give opportunity to change in mental calibre and emotional control.

Even the salutary effect which the ordinary school has upon many children is wholly inadequate to overbalance the effects of home training. This is due in part to lack of facilities for handling such a child. It imperatively needs careful and continuous individual attention. A pliable adjustment in the divisions of work, rest, play, of methods, of nature of studies, etc., is necessary in each case. This is, from the actual condition such as we find in our schools, impossible, owing to the fact that the teacher must handle large groups at a time, and attempt to establish a certain standard of work to which all the children must conform. The atypical child will usually be unable to keep up with its classmates, and will drop further and further behind. As the teacher is not expected to be a deeply versed psychologist and physiologist she has no real understanding for the child's difficulties. She will probably attribute false motives or conditions, and will upset it still more by the use of extraordinary methods. She will perhaps seek to individualize in this way, but only to the disadvantage of the child.

There are instances in which teachers have shown themselves

cognizant of the real difficulties. Through their better appreciation they must realize the hopelessness of independently attempting to put the child in equilibrium. Their work with it is along lines of development essentially different from those of the home. Within their field they are confined to general mass results. If they take hold of the child when it first begins schooling, and therefore before it is still further thrown out of gear by mechanical, abstract, or other detrimental methods, they may be able to obtain fair results by way of scholastic attainment. Even then the limits are very confined. In the first place, there is always the impossibility of accurate adjustment to meet the child's extraordinary physical difficulties of various kinds. But in addition to this difficulty there always exists the constant clash in methods between the school and the home. This does not take the form of open antagonism, perhaps, but at all events involves a struggle to determine which shall be the preponderant one. The teacher's methods which, if she appreciates the difficulties, we will presume to be correct, must overthrow certain wrong habituations from the home and must thus be out of harmony with the methods employed at home. The result is that the child pendulates between two radically different sets of environment. The very existence of this struggle between school and home influences, which makes itself felt in the child, defeats the ends of its development. In place of a general interaction of influences to replace the vacillating condition by equilibrium in attitude and habits, the former condition is heightened. The progress gained in each environment ought to assist development in the other. Under these conditions it is impossible.

Educators have attempted to overcome the inelasticity of the mass instruction by the introduction of "ungraded classes." By this means they have attempted to overcome the objections raised in educating the exceptional child. The atypical child, for whose benefit especially these were established, cannot, however, be successfully educated in them, owing to the very vital objection of its pendulations between school and home environments. Upon modification, however, these classes can be made of especial benefit to the *pseudo-atypical* children. It is an observation worthy of note that at present few, if any, atypical or even pseudo-atypical children are to be found in these classes, which are rather more for the indefinite group of "bad boys and girls." The

reason for this is that the differentiation of the children is often in the hands of those least qualified to know what constitutes the atypical. This is no discredit to them, because many educators have in numerous instances failed to preserve the exact meaning of the term in which scientists have agreed to accept it.

In view of these considerations it becomes evident that *it is impossible to obtain satisfactory results with atypical children in the public or private schools in conjunction with the home environment.*

Such children must be removed into an environment where perfect harmony and interaction exists between all influences. They require more than the school and home environments can offer. There must further be the intimate co-operation of the medical specialist. Rigorous hygienic treatment is invaluable. The primary physical basis of their troubles dare not be overlooked. That will frequently be the only available clue for the discovery of the reasons underlying their emotional and educational difficulties. The latter are largely subsidiary developments from this primary cause. Special equipment is imperative by way of facilities and methods which are adapted to cope with the distinct problems each child presents.

Such careful treatment and equipment can be offered only by institutions especially adapted to the requirements of such work. Competent specialists, both in the fields of education and medicine, must co-operate in a study of each child's difficulties and needs. Such an institution must be, as it were, a psycho- and physiological laboratory for a scientific study of each case. In this way not only will each child receive the necessary observation, but data for a deeper study of the general problems will be obtained. The care of the child throughout the entire scope of its development can be consistently co-ordinated. Small school-rooms, adapted to individual or small group instruction must be the unit underlying the general architectural plan for the school department. Numerous playrooms accommodating small groups of children have been found to be more satisfactory than a few of large capacity. Order and special supervision are possible to a greater degree. Individual or double bedrooms, *not dormitories*, grouped about a central room for a teacher or caretaker are desirable, both for the purpose of fostering a home atmosphere and to admit of better supervision. For such ends the cottage

system is undoubtedly superior to any other for residential purposes.

Thus, a close co-operation of school and home influences with educational and medical supervision is possible. Not only are these important aspects of child growth thus brought under close observation and guidance, but another, at least equally important aspect, namely that of child play, is brought under the immediate supervision of a caretaker. Few realize the educational possibilities which child play may afford the educator.

When an atypical child is introduced into such an institution, of which Dr. Groszmann has at present the only one for this distinct class, it possesses a great number of wrong habituations. The nascent tendencies, which were either wholly undirected or *misdirected* by the parents, have undergone quite an extent of perversion and degeneration. The first problem confronting the educator is how to eradicate these and at the same time replace them by rational ones. This is a matter of experiment and time. Even with the proper methods frequent relapses on the part of the child into these early habituations will occur during the first year or more of its new growth. Visits home or by the parents of the child almost invariably overthrow for a time the progress made, or bring out new peculiarities unobserved before. It is, therefore, advisable that vacations or visits are made brief and infrequent, and where possible, are even entirely eliminated. It is only when the new set of habits has become firmly impressed that the early perverse impulses are suppressed in the old environment.

It is usually observed that when a child is first introduced into its new environment it is on its good behavior. Much of the future success depends upon the nature of the rapport to the new surroundings established during the first few days or weeks. An opportunity to gain a firm hold upon the emotional as well as the intellectual life of the child is given, which can hardly be made to recur if once allowed to slip by. The child will either respond favorably or feel a repulsion which will last unchanged even under altered circumstances. The future plasticity of the child's mind will depend upon first impressions of a favorable kind.

It is just in the beginning that the contrast of general attitude in the old and new environments will make itself most keenly

felt. Resistance for the traditional standpoint is usually the most natural impulse. In exceptional cases, where it is best to impress the new attitude deeply from the very start, evidence of superior power and will are necessary. Such cases are rare, and are to be resorted to only if other methods fail. In most instances of difficulty it is a matter of discretion and tact to place the proper point of view before the child. It is very valuable to avoid friction and useless aggravation and to lead the child upon the right path by waiving direct contention, yet, slowly and consistently, by indirect allusions, to point out to it the mistake. A few instances of this kind will impress upon it the teacher's correct attitude and awaken a general confidence. Direct argument, on the other hand, often appears as a necessary excuse for the attitude, and is, therefore, dangerous, as it may awaken in the child a hope of successful contention, involving retort, dissent, etc., and a general weakening of the desired influence. As soon as the proper rapport is attained the child is ready to believe almost anything it is told. It is just this lack of mutual understanding which is largely responsible for the warpings that are found.

Parents and educators are apt to disregard the value of trying to ascertain the child's point of view, and to mould this into proper form by inductive methods. They are too apt to consider it merely a matter of impressing their own viewpoint upon the child, regardless of the apperceptive basis for its assimilation. They fail to realize the difficulties which beset the child's mind, and they are surprised when incongruities of a startling kind are brought out. We all can think of several instances in ourselves where certain associations, formed in some earlier part of our development, persist within our minds in spite of the fact that their absurdity has long since been proven. Yet, these warpings are due entirely to the presentation of these concepts.

The educator must show an attitude of kindly interest and sympathy, and must feel real *love* for each of his children. A child, and especially an atypical child, will readily enough feel the difference between the love you give it—a love which is strong and consistent throughout all the difficult moments of a regeneration—and the impulsive and misguided love it has received in its native environment. Although this love may appear more exacting in the directions of discipline and judgment, the

child instinctively feels that it is exerted in behalf of its own best interests. It accepts his personal influence and yet feels that its own personality is being preserved. Few may realize the pain and yearning that fills the heart which is ruthlessly trampled upon and made to conform to what to it are abstract standards, regardless of individual deviations. Many educators consider this conformity an important hardening and strengthening process which prepares the maturing child better for the struggle for existence in a ruthless world. For the mass of children, whose individuality can be comparatively easily overthrown, this method may do little harm, although it crushes all possibility of whatever individual development there exists. These educators appear to forget that all successful progress at all times has been due to *individual variation*, often in spite of attempts to conform them to a fixed set of standards of development. It is individuality which marks evolutionary progress. The atypical child has an especially sensitive Self, and one which ordinarily is constantly put on the defensive. Yet, the atypical embodies the possibility of development into a valuable social force, even to the extent of genius. Greatest progress can be made by moulding this Self as a Self, and not as a factor for elimination with higher development. Higher development must be the expression of a higher evolution of the Self. A moulding of the Self through its preservation and guidance will determine for itself the value of practical, scholastic, social, or other form of development. It is in this respect a particularly delicate and responsible role that the educator of the atypical child has to fulfill.

It is a fundamental principle in education that the empiric basis of knowledge is developed and strengthened through contact with a higher form of knowledge. Education is not for the purpose of *giving*, but of *guiding* the possibilities embodied within this empiric basis. It is upon this principle, for instance, that all religious concepts rest. Within each one of us there is a constant endeavor to interpret what our present knowledge does not permit us to grasp in its full meaning. Religious and ethical teachings are but a similar attempt. Experience constantly eliminates the fallacies and brings us, step by step, nearer to the real truth. Thus, the growing emotional and intellectual life has a specific initial potential for development which is equally strong

in the direction of right and wrong. Our concept of right and wrong are relative, but our initial potential is constant. The direction this potential will take depends upon how the influences which intercourse with nature and intellect exert over us are absorbed. For all of us the determining factors will be expressed by our reaction to our environment. In most of us physical constitution and mental calibre will act as modifying, though not essential elements. It is only in extreme cases, such as feeble-mindedness, criminality, etc., etc., that this condition and calibre is of primary importance. The atypical child has had its potential directed on the wrong path. It will continue in that direction until fixed. If, however, it receives the proper educational recasting in time—experience has found this to be anywhere under the age of sixteen years—and the downward progress is arrested and reflected, an approach to the typical is assured, if time for an establishment of equilibrium commensurate to the extent of the downward progress is granted. In the latter case the greater knowledge and influence of the educator is of inestimable value as a directing force. This re-iterates more clearly the law previously mentioned, namely, that the atypical child is in a state of lost equilibrium and approaches either the abnormal or normal as an ultimate goal. Proofs of such inclination in each direction have already been demonstrated since this newer conception of the “exceptional” child has been evolved.

A wider application of the proper education of the atypical child has yet to be developed. State or municipal institutions are necessary to obtain this end. Private endeavors can only indicate the path and, as pioneers, work the field to determine whether or not its further exploitation warrants the expenditure of state funds. From the point of view of possibility of successful education nothing can be more favorable. From the point of view of sociological and economical ends the results well warrant the expense, for the atypical child, changed into a normal man or woman, is a valuable adjunct to our social structure. It frequently possesses a potential of great usefulness and even of genius.

THE NEURITIC TYPE OF PROGRESSIVE MUSCULAR ATROPHY. A CASE WITH MARKED HEREDITY.*

BY ARCHIBALD CHURCH, M.D.,
OF CHICAGO, ILL.

It was just twenty years ago that Charcot and Marie gave a description of the neuritic type of progressive muscular atrophy, a description which remains classical to this day; to which very little has since been added and from which practically nothing has been taken away. In 1899 Sainton published a Paris thesis into which he gathered the majority of cases up to that time reported, and published an additional one of his own with full autopsy and histological examination. He carefully scrutinized all reported cases and exercised considerable latitude in excluding a number which might very properly have been accepted, among them one or two which had been submitted to post-mortem examination. Based upon his collected cases he describes the Charcot-Marie type as commonly hereditary and often familial, although occasionally occurring in isolated cases. It affects men much more frequently than women. Commonly it develops first in the lower extremities, sometimes in the upper, and occasionally in all four at once. In the lower extremities the atrophy does not extend above the lower third of the thigh, and in the upper extremities above the proximal portion of the forearm, atrophy and paralysis advancing in parallel. The hand frequently presents the claw type, while there are special deformities in the feet due to the development of paralytic club foot and the aspastic weakening. Changes in electrical responses are both quantitative and qualitative, and vary from slight reduction to complete absence, and occasionally show partial or complete reaction of degeneration. Disturbances of sensibility are common but not constant. Fibrillation is almost invariably noted. The patellar reflex is reduced or abolished, very exceptionally increased. The nerves in the affected parts show a progressive interstitial neuritis, but the lesion is not confined to the periphery as in the two sectioned cases which he admits to his classification the columns of Burdach were degenerated without the involvement of Lissauer's zone.

*Presented before the Chicago Neurological Society, March, 1906.

The pyramidal tracts, the cells of the anterior horn, and Clarke's columns were involved in the degenerative process. In his own case the changes in the peripheral nerves were very slight, while the case of Marinesco, quoted by him, showed extensive neuritic changes. It should be added that in unusual cases facial, ocular, faucial and laryngeal muscles have been affected, and in certain cases the atrophy has progressed to the involvement of every skeletal muscle. Rarely optic atrophy has been recorded.

Since the appearance of Sainton's thesis a considerable number of additions have been made to the casuistics of the subject and the importance of this type of progressive muscular atrophy as constituting a link between the so-called pure myopathies and the spinal type of progressive muscular wasting has been recognized on every hand. However, some question as to the hereditary character of the disorder has been raised, and Ansbach even questioned whether it is hereditary in any way whatever. (*Univ. Med. Mag.* Vol. XIII. p. 287.) I have found in a revision of the cases published during the past eight years a notable family group reported by Warrington (*Lancet*, 1901, Vol. II, p. 1574). In this instance a family presented three cases of the peroneal type occurring in the mother and two sons. A more important instance is published by Brasch. (*Deutsch. Zeitschr. f. Nervenheilk.*, Bd 26, p. 302.) It concerned a family presenting the disease in three successive generations. In the first generation isolated paralytic club foot appeared, while in the third generation the club foot was attended by progressive paralysis and atrophy. In the second generation father and son presented weakness in the legs which progressed steadily to complete paralytic club foot. Commencing in the legs at the 14th year, at the age of 40, it was followed by involvement of the hands and arms. It then advanced with great rapidity, eventually presenting external characteristics similar to those of the Duchenne-Aran type. These cases presented widely distributed fibrillary twitching. The distal portions of the limbs were notably anesthetic in all four extremities. The reflexes were abolished, and there was qualitative change in the electrical responses of nerves and muscles. Pain and sphincter troubles were absent. Fabian (*Inaug. Dissert.*, 1898) also reports an instance in which a father and son were identically affected, as was also the father's brother.

I have recently encountered a case which presents, if we can rely upon the statement of the patient, a most notable instance of heredity. An attempt will be made to verify as many of the facts here recorded as is possible. It appears, however, that the disease has positively appeared in five successive generations, is perhaps apparent in the sixth, and there is unverifiable but reasonably dependable hearsay evidence that it was also present in three anterior generations in succession, making nine generations all told.

CASE.

PERONEAL TYPE OF PROGRESSIVE MUSCULAR ATROPHY OF THE FAMILIAL TYPE, EXTENDING THROUGH SIX AND PROBABLY NINE GENERATIONS

George T. W., 34 years of age, unmarried, was born in Cumberland, Md., and had three brothers and two sisters. Of these children, the oldest brother died in infancy. Two brothers survived. One, two years younger than the patient, is living somewhere in California, exactly where is unknown, and is similarly affected. The other, as far as known is well. His two sisters are living; one has been married six years but has no children, the other, who presents some weakness of the ankles, has a boy of ten who also has some weakness of the ankles and shows a tendency to stumble and fall in running and otherwise to call to the attention of the patient many of the features with which he himself is familiar in the case of his brother and in his own experience.

His mother's family consisted of four children, three sisters and one brother. The uncle developed the disease in early adult years and died at the age of 27, unmarried. Both aunts were married but had no children. Both are now blind, said to be affected with optic atrophy, and one is deaf.

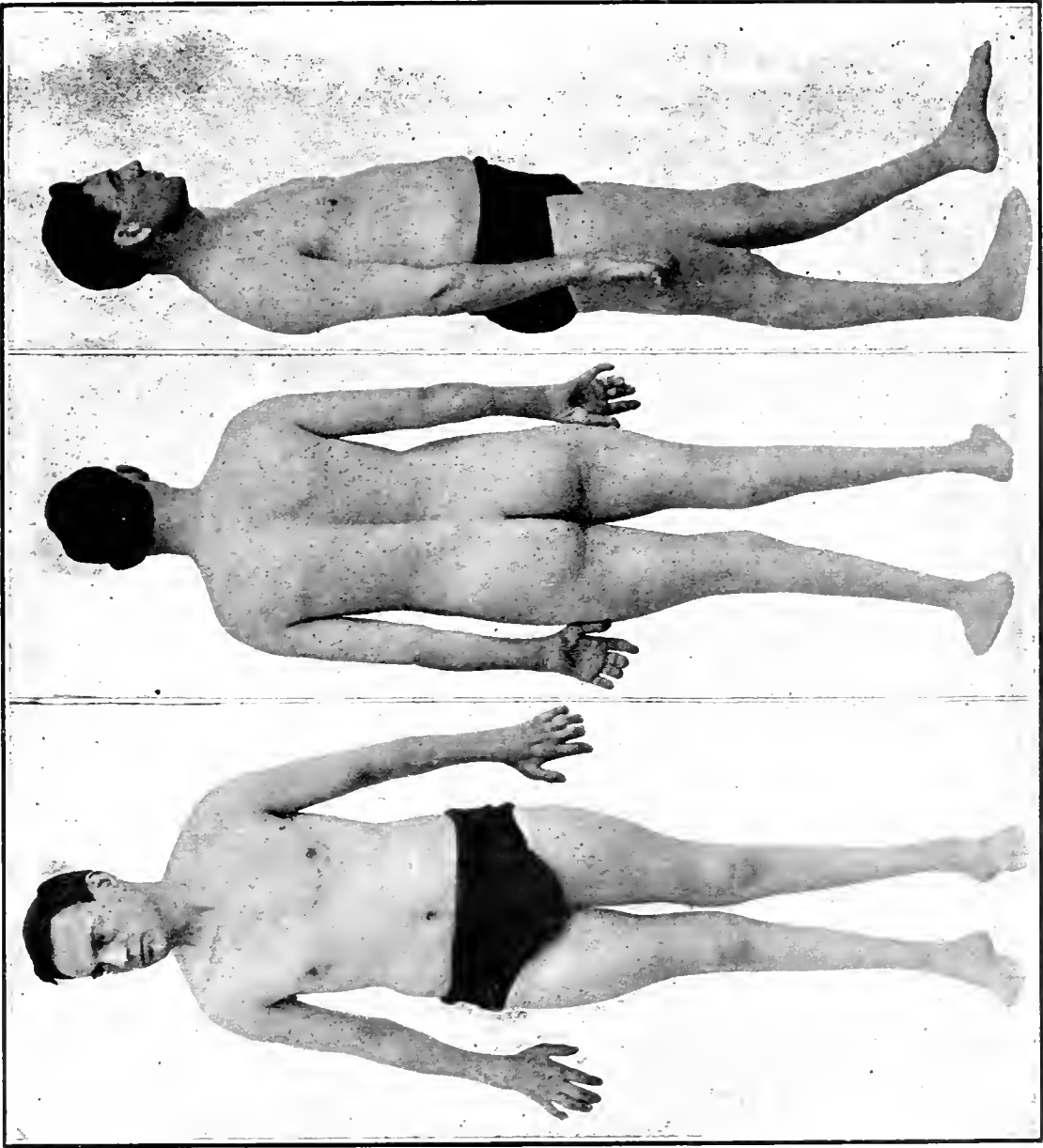
His grandmother on his mother's side was one of five children, having one sister and three brothers, two of whom were affected with the disease, and from these grand uncles most of the information is obtained regarding previous generations. One, who lived to reach the age of 70 was unmarried and even to the end of life was able to get about and do a little work, the affection being mainly confined to the lower extremities. The other was married and had 5 children, who with their children also are unaffected. The third grand uncle had seven healthy children.

The great-great-grandmother was also one of 5 children, having two sisters and two brothers, one brother being affected with the disease.

The grand uncles before mentioned insist that they were informed that three other anterior generations had shown instances of the same disease, in males only.

Owing to the fact that the disease has invariably descended by the female side with a change of family name in each generation, tracing is difficult. It is the belief in the family that the disease has tended to become more severe and more extensive with succeeding generations. Thus in the generation of the grandmother those affected were only partially incapacitated. In the patient's generation general disability is almost total; it appeared early and rapidly involved all four extremities.

Personal History.—The patient's parents separated in 1880 and three of the older children, including the patient, a brother and a sister, were placed in an orphan asylum in Auburn, N. Y., the mother taking care of the two younger children, the father going West. The patient has never had any serious illness, accident, injury, infection, or intoxication and his habits have been fairly good. In 1882 he was taken out of the asylum by a party with whom he stayed for a year, when he went to work as a newsboy and bootblack until 1885. His father, who had gone to St. Louis, sent for him to join him at that place, where he worked in the St. James Hotel as a bellboy until 1888. His ankles then began to bother him and running up and down stairs became difficult owing to the weakness of the ankles which were very apt to turn under him and throw him heavily. In 1889 the ankles were swollen badly. He was given a liniment for this swelling and a plaster cast was applied by a doctor in Belleville, Mo. A few years later he was advised to wear braces on account of the turning of his ankles which were then so badly affected that he was constantly tripping and falling over things. The swelling and pains disappeared, but he felt numbness in the feet and ankles, especially at night. Braces were worn for three years and finally left off on account of their weight. In 1891 he returned East and found some relatives living at Syracuse, N. Y., and then for the first time learned of the hereditary nature of his disease. From 1893 to 1895 he worked in a machine shop and while there noticed swellings in his hands similar to those that had appeared in the feet, but also observed that the hands would get numb and cramped when he attempted to do certain tasks, such as grinding a drill, and that at the same time his thumb and finger would become weak. He noticed that in picking up small articles his fingers were numb and that he would drop articles unintentionally. A physician in Syracuse sent him to a hospital, where he remained three months, receiving massage and electricity. He was discharged as incurable and advised to go to the country. This he did and worked about at odd jobs with sufficient ability to make his expenses. On advice he got a bicycle in order to exercise the muscles of the lower extremities. He used this for two years, when, owing to leg weakness he had to give it up. In 1898 he went to Syracuse and took up house painting: he had at different times worked as a



Showing Atrophy of Muscles in Distal Portions of the Four Extremities.

carriage painter but did not come in contact with lead in any manner until after the development of his disease. He was able to do such work as could be reached while standing, but was unable to mount ladders. This he continued until 1904, since which time, owing to advancing disability, he has been drifting about the country.

Status præsens. Upon examination we find a man of fair intelligence, about 5.11 in height, assisting himself with a crutch in walking, but with that aid getting along very briskly. Upon being stripped he presents a notable atrophy of the muscles in the distal portions of the four extremities. This is well shown in the photographs. In the lower extremities the small muscles of the feet seem to have practically disappeared, and he has no motor control of ankles or toes, the foot being flail like at the ankle joint. The muscles of the leg have all practically disappeared. There is a decided thinning in the muscles of the lower third of each thigh, particularly sharp in contrast with the notable adjoining muscular masses of the upper part of the thigh. The circulation in the parts is not very good and they are somewhat blue and cold. In the upper extremities the left hand is more involved than the right and shows a typical anthropoid position of the thumb. There is complete atrophy of the thenar and hypothenar eminences and excavation of the intermetacarpal spaces. There are no contractures anywhere, all joints being perfectly flexible passively, and a certain amount of power remains in the hands and wrists. The forearms are decidedly thin below the elbows. At the shoulder and pelvic girdle and on the trunk the musculature is excellent. There seems to be no local hypertrophy or pseudohypertrophy at any point. The facial, faucial and laryngeal muscles are intact and there is no evidence of disturbance of the cranial nerves.

In the atrophic parts reflexes as a rule are absent. Percussion on the extensors of the wrists and fingers gives reduced response. Knee jerks are present, heel jerks and plantar reflexes are entirely absent. There is no sphincter involvement and all bodily functions are well performed.

Sensation in the affected regions is notably blunted. The toes and feet are almost completely anesthetic, the legs show reduced sensibility for all forms of stimulation, the sensory disturbance ending at the knees. The same condition is present to a less degree in the upper extremities below the elbows.

Below the knees it is impossible with any current the patient can tolerate, and owing to the anesthesia a very strong one may be employed, to secure any response in muscle and nerve. In the muscles of the forearms and some of the muscles of the hand there is a partial reaction of degeneration. In some instances the response to faradism is very slight, while the muscles will respond to galvanism. Usually at such points positive and nega-

tive responses are equal, rarely the negative is the most active. Fibrillary tremor can occasionally be seen in the atrophic parts, and the patient now frequently experiences quivering of the muscles of the upper part of the thigh, the sternoclydomastoids and the eyelids. Owing to the weakness of the ankles where paralysis is complete the patient walks with a high knee action. By over-extending the knee and depending upon the ligamentous control of the ankle joint he is able to get along in a remarkably satisfactory way in view of the extent of the paralysis. In standing he sways about a good deal, balancing himself by the action of the hip and thigh muscles, but stands with eyes closed nearly if not quite as well as with them open.

According to the patient's best knowledge no female has ever been affected, but in this connection we may recall the interesting statements of optic atrophy in his two maternal aunts and the weakness of the ankles in his sister's case.

SYRINGOMYELIA WITH INVOLVEMENT OF CRANIAL NERVES. PROBABLY A SYRINGOBULBIA.

BY ARCHIBALD CHURCH, M.D.,
OF CHICAGO, ILL.

Miss P., 26 years of age, is a member of a somewhat nervous family, which, however, presents no notable evidences of organic or functional nervous diseases. In the mother's family there were a number of cases of consumption, but none in the patient's immediate family.

As a child she was not rugged and up to the age of 15 went to school only during the cold weather as in the warmer season the patient was weak and nervous. Between 15 and 17 she went to school constantly during the school terms. She was subject to a number of attacks of diphtheria, between the ages of 19 and 22, and suffered from tonsilitis two or three times every winter for a number of years until about 8 years ago. At the age of 10 she was out of school for one year on account of chorea. Just prior to her 18th birthday, owing to twitching of the right side of the face and nervousness, she discontinued attendance at school and remained home about 8 months. She then made a visit in Michigan for about a year and upon her return home was free from the twitching and nervousness. During the two years from her 18th to 20th, she noticed that she would occasionally stumble and fall without reason. About two years later, at the age of 22, the patient's left hand and arm seemed slow for all muscular movements. This condition became gradually more marked, until she could not open her hand nor raise it to comb her hair or otherwise employ it to any advantage. This stiffness of the left hand and arm subsided during the next two years, leaving it relaxed and capable of weak movements and some use. Occasionally the hand was closed, blue and cold. At the age of 23 the left leg became slightly spastic and this condition increased so that in a few months the limb was so stiff that the heel could not be put to the floor and the patient walked upon the toes and ball of the foot. With the onset of symptoms in the left side she also noticed that sensation in this side was impaired. On several occasions she burned the hand without perceiving it until the blister developed. She also had the experience of pinning her collar at the back of the neck through the skin without causing any sensation whatever. There was more or less rigidity for all movements on the left side until about a year ago when the spasticity apparently subsided to some extent, so that the left foot could be gotten flat to the floor. For six months the

patient had at times had involuntary bowel movements after taking cathartics or under similar conditions. She had never shown any hysterical emotional disturbance.

At the present time the patient presents a frail, emaciated appearance and walks with a left-sided spastic gait, tending to drag the left toe along the ground, with a notable limp on that side because of the flexed condition of hip and knee. At first



Showing Atrophy of the Right Side of the Tongue.

glance it appears as though the patient had a right-sided facial atrophy, but this appearance upon close examination seems to be due to a spasm of the muscles, which in character resembles a facial tic. The patient says that it began as a quivering in the eyelids, of which she was conscious for a number of months before it was objectively evident, and gradually extended to the right side of the face. She is able to restrain this spasm for a

time and thereafter it is temporarily worse. When it subsides the eye can be opened fully and equally with that on the left side and the appearance of retraction of the ocular globe due to the spasm of the lids is seen to be apparent only. Her eyesight is good, the optic nerves are unaffected, there are no pupillary signs, there is no lack of ocular balance. The sensation of smell is equal on both sides and sensation in the nose is undisturbed. On

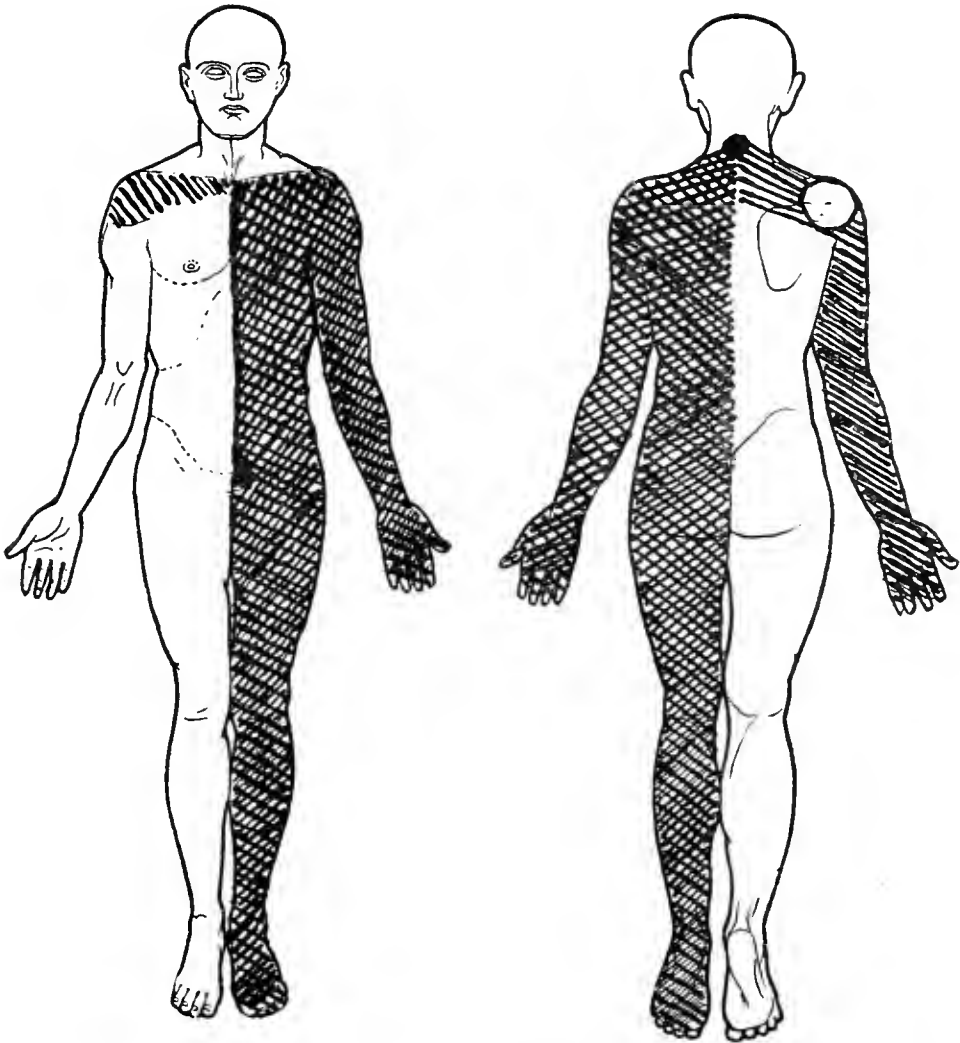


Showing Scoliosis of the Spinal Column.

protruding the tongue it is seen to be decidedly atrophic on the right side and the tip of it deviates slightly in this direction, but the deviation is not as great as the extent of atrophy would lead one to anticipate, and lateral movements are well performed. The palate and pharynx are apparently normal and their functions are unimpaired. There is no difficulty in phonation or swallowing. The muscles about the neck and shoulders are

decidedly atrophic on both sides, but more so on the left, and this condition is present in the arms and hands, also to a greater extent on the left side, this hand presenting a certain amount of clawing is nearly useless. The atrophic muscles respond to all varieties of electrical stimulation in normal sequences and in vigor proportionate to the muscle mass remaining.

The spinal column shows scoliotic curves and the head is car-



Lines from right to left, from above downward, indicate loss of cold sense.

Lines from left to right, from above downward, indicate reduction of heat sense.

The entire left side, anterior and posterior surface, marked with crossed lines, shows decided hypalgesia.

Touch is normal everywhere except in an area the size of a silver dollar over the seventh cervical spine, where there is anesthesia to all qualities of sensation.

ried far forward with the face turned slightly to the left, but the spine is reasonably flexible throughout, the deviation apparently being due mainly to muscular weakness. There is no atrophy

in the lower extremities, but the left leg is decidedly spastic. Tendon responses throughout the body are notably increased, the jaw jerk, however, being about normal, and the spasticity on the left side is still further manifest by the ankle clonus a Babinski and the very exaggerated knee jerk on that side.

An examination of the sensory disturbances shows that the entire left side of the body from the neck down is partly analgesic and over this area perception of degrees of heat is greatly blunted. Across the right shoulder posteriorly and anteriorly and down the posterior surface of the right arm there is also reduction of perception of degrees of heat. Just back of the shoulder on the right side there is an area of normal perception, while at about the 7th cervical spine there is a plaque as large as a silver dollar which is absolutely anesthetic. The diagrams roughly indicate the sensory conditions. Everywhere touch perceptions are fairly keen.

The questions of interest in the case appear to be principally in relation to the involvement of the cranial nerves. The patient believes that the wasting of the tongue dates back only about two years, but it is evident that a certain degree of atrophy might have been long present without attracting attention. The spasmodic disturbance of the 7th nerve in a nervous choreic individual presenting as it does some of the features of facial tic, may be purely of that order, though its association with organic disease and involvement of the hypoglossus leads to the suspicion of irritation from an organic process in the bulb, and at times the nature of the spasm in the face gives some support to that impression. The movements of the facial muscles are not always exactly mimetic.

Many facts in regard to the order of development of the case are lacking, as for instance, the exact programme pursued by the atrophy and the successive involvement of the muscle groups.

Regarding hysteria as a possible explanation of the sensory dissociation it may be said that the outlines of the sensory fields on the two sides of the body, the integrity of the visual fields for color, and the lack of fluctuation in sensory symptoms are not compatible with that assumption.

HEREDITARY CEREBELLAR ATAXIA AND GENERAL PARESIS

A Supplementary Report and a Correction.

BY HUGH T. PATRICK,
OF CHICAGO, ILL.

In the JOURNAL OF NERVOUS AND MENTAL DISEASE, March 1902, I published a paper entitled Hereditary Cerebellar Ataxia with Report of a Case. The title was one of expediency. I quote the last paragraph preceding the report.

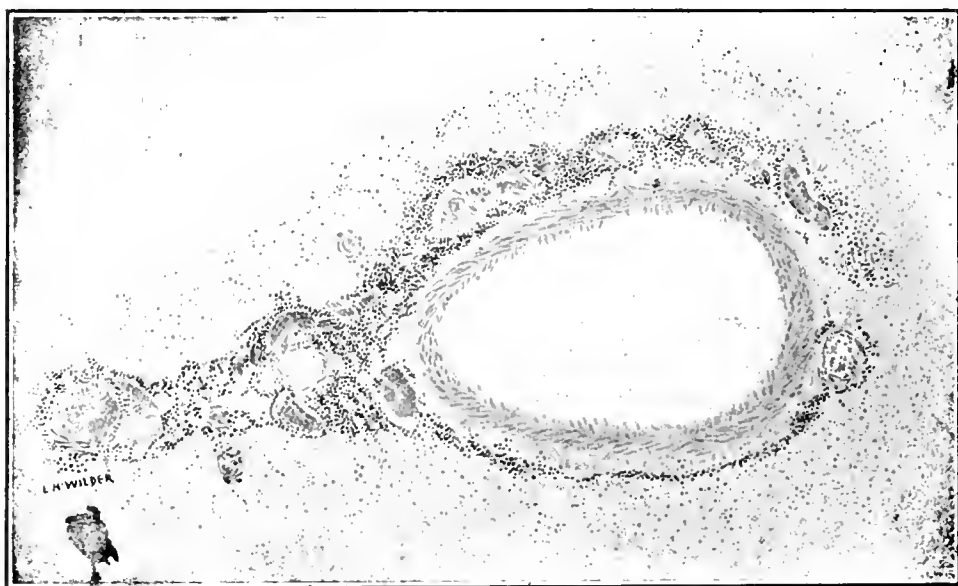
"Doubting the existence of a disease meriting the title hereditary cerebellar ataxia, I have still for convenience called my case by this name. Should there really be such a malady, I am naturally in doubt as to whether I am reporting an example of it."

My case was that of a young man eighteen years old when first seen, who presented many of the symptoms described by Marie as belonging to hereditary cerebellar ataxia, with very considerable mental failure added. I quote a paragraph following the report.

"In this case the progressive mental failure, rigid pupils, ataxic gait with exaggerated reflexes and indistinct speech, together with the history of miscarriage and death in infancy, at once suggest precocious general paresis due to inherited syphilis. On this supposition the elder brother may have had the same disease, or, bearing in mind the hemiplegia, *syphilis hereditaria tarda*. Remembering that precocious paresis is apt to be atypical, I have had this possibility constantly in mind. Even now I have no inclination to be dogmatic on the subject, but the case has never looked to me like general paresis, and I think that diagnosis could not be maintained. Adequate evidence of syphilis in the parents is wanting. What Freud noticed in the family of his diplegics and called *eine Neigung zur Leichtsterblichkeit* (vital vulnerability) in my opinion explains the early deaths and miscarriages in the family as well as does the theory of specific disease. Incoordination distinctly antedated mental deterioration, and has throughout dominated the clinical picture. No trace of a delusion has ever been detected; tremor of lips, tongue and

hands has been consistently absent. In addition, absence of the Argyll-Robertson pupil, of analgesia of the legs, of good-natured self-satisfaction and mental depression alike, would tend to exclude parietic dementia. Extreme over-action of the facial muscles is no part of the symptomatology of this disease, and by this time there should be more motor feebleness than is the case."

The report carried the patient almost to the time of death. He became entirely helpless, quite demented, greatly emaciated and died of marasmus. The brain and spinal cord were given to Dr. Lewellys F. Barker, and his findings seem to show conclu-



Showing Cellular Infiltration of the Pia and About a Blood Vessel.

sively that I was entirely wrong and that the case was one of general paresis, probably due to inherited syphilis.

The following is Doctor Barker's report, and I am also indebted to him for the excellent sketch herewith produced. In a note accompanying the report he says: "I suppose there might be a difference of view as to whether this is 'parietic' or simply 'syphilitic' but I regard it as parietic."

Report on the Pathological Anatomy of Dr. Patrick's case.

Pia Mater Cerebri. Macroscopically turbid and thickened.

Microscopically everywhere infiltrated with lymphoid cells, especially around the blood vessels, but also diffusely among the connective tissue strands. The vessels are distended with blood, the whole pia is thickened not only on the surface of the gyri,

but in the depths of the tissues. Wherever the pia extends the aggregations of lymphoid cells are met with. In the accompanying figure, the infiltration (especially perivascular) with small mononuclear cells in a fold of the pia extending deep into a sulcus is well shown.

Cortex cerebri. The capillaries and small blood vessels are distended with blood and are prominent in the microscopic picture. The walls of a great many vessels show aggregations of lymphoid cells in the perivascular spaces.

The nerve cells of the cortex are smaller than normal, many of them being distinctly shrunken. There is marked proliferation of the glia and in hematoxylin or separation glia nuclei stand out prominently. In Weigert preparations the fine medullated fibres of the cortex are decreased in number.

Spinal cord. Marchi and Weigert preparations reveal no degeneration in the white matter. The gray matter looks normal. The cord is large and well developed. The only abnormality met with is an occasional group of lymphoid cells in the pia, but the pia mater spinalis is nowhere invaded with these cells as the pia mater cerebri is. Sections were cut from every segment of the cord.

Cerebellum. Section were made through both hemispheres and through the vermis. The cerebellum is large and well formed. No sclerosis. No atrophy. The cerebellar nuclei show no alteration.

Pathological-Anatomical Diagnosis. Chronic meningo-encephalitis.

LEWELLYS F. BARKER

Papers published since mine have rendered it almost devoid of interest but this addendum and correction are due those who may have read it and to Dr. Barker who made such a painstaking examination of the material.

Society Proceedings

THE BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.
January 19, 1906.

The President, DR. MORTON PRINCE, in the Chair.

The Case of a Patient with Unilateral Disorder of Sensation in the Fifth Nerve.—This was reported by Dr. E. W. Taylor. The patient was a minister thirty-seven years of age, of exemplary life. Following about two weeks after a cold and exposed ride he noticed numbness of the left side of the face, which increased and persisted. When examined at the Massachusetts General Hospital there was diminished sensibility in the entire distribution of the fifth nerve on the left side. Taste was preserved in the posterior portion of the tongue, but anteriorly on the left side it was entirely lacking. The masseters and pterygoids were normal, and a careful examination of cranial nerves, of the throat and of the nervous system in general revealed absolutely no other disturbance. The case was reported as an extremely unusual disturbance of uncertain etiology. A good prognosis was given, although experience in similar cases was lacking.

Two Cases of Peripheral Nerve Surgery.—Reported by Dr. Walton. The first was a case of neuroma (fibroma) in the course of the musculocutaneous nerve. It was noted by the operator (Dr. Lincoln) that touching certain nerve fibers which ran over the tumor produced upward and outward movement of the foot. These fibers were therefore carefully dissected away from the tumor and preserved *in situ*, the tumor being removed by cutting the trunk of the nerve above and below it. No motor paralysis followed the operation and sensory paralysis was only temporary.

The case illustrates the importance of attempting to save even a few nerve fibers in such cases.

The second case was that of a young man who fell from a chair striking the corner of a shovel which penetrated his buttock. Immediate paralysis was noticed, limited to the distribution of the external popliteal nerve. There was no history of injury to the knee, no pressure from splint or otherwise in the region of the knee, and no bruise over the external popliteal in the leg.

It was therefore decided to investigate the sciatic in the region of the injury in the hope of finding either a high division or a local injury to one of the two main bundles which make up the sciatic nerve in that region. The operation was performed by Dr. C. A. Porter. It was found to be a case of high division in which the external popliteal branch had been severed, or practically so, as was indicated by the cicatricial constriction with tumefaction above and below.

The injured region was removed and *suture a distance* performed, since the loss of substance was too great to admit of direct suture. Cargile membrane was wrapped about so as to include both the external and internal popliteal trunks of the sciatic at this point, to aid in forming a canal. Grafting of the peripheral portion of the injured nerve upon the sound internal popliteal was considered but rejected. It was deemed wiser to run no risk of injuring the internal popliteal. In case restoration of the external popliteal fails, either the grafting

operation will be tried or tendon transplantation will be performed to relieve the toe-drop, for which purpose the integrity of the internal popliteal nerve is essential.

The Mental Element in the Etiology of Neurasthenia.—Dr. Lane read this paper, of which the following is an abstract.

Overwork, overstudy, and heredity are canonical causes of neurasthenia. The writer wishes to deny that overwork is a cause and to show that the prolonged influence of depressing emotions is the common exciting cause. We are thoughtlessly misled by the term nervous exhaustion to regard the psychosis as the result of over-exertion.

In experience we do not find a history of overwork in this trouble, and on the other hand few of those who are overworked have this trouble. The school teacher has many causes for worry; the washerwoman has longer hours but fewer worries.

The busiest men in commercial life break down after failure or exposure of misdeeds, not from close application to business.

Worry is fear. Fear is a depressing emotion. Disappointment, mortification, results of nagging, social failure, etc., are necessary results of the complex life of the metropolis. Such opportunities are more rare in a rural life.

Neurasthenic symptoms follow certain infections. It is probable that the effect of depressing emotion is to develop similar toxins so that the pathology may be the same.

The suppression of individuality by the constant domination such as exists where two or more women are constantly housed together results in the mental breakdown of one (a case cited).

While the so-called neurotic temperament is more susceptible to these depressing influences the writer believes no one is immune to all such.

It follows that in many of these cases the rest cure is not indicated, but rather a cheerful occupation that will divert the attention and break up vicious habits of thought.

Each case must be studied carefully and treated individually. Mere physical exercise for its own sake is not desirable in these cases.

Dr. Fuller said they were indebted to Dr. Lane for calling attention again to the insidious causes of neurasthenia.

It is important that neurasthenia be considered as a fairly definite entity, and not as an all comprehensive term including every functional neurosis. It is not so very long ago that alienists made a diagnosis of "simple melancholia," by which was designated a state of simple depression without delusion, hallucination, agitation or stupor. While this is not now considered a scientific diagnosis, it was and is descriptive of a class of cases not infrequently met with. So, the diagnosis neurasthenia should be limited to conditions which might be termed simple pathological fatigue, in which weakness and irritability are the characteristic symptoms. The long list of symptoms of neurasthenia given in the text-books therefore becomes unessential and accidental to the fundamental condition. Hysteria, hypochondria, neurasthenoid states, ideo-obsessive states, habit psychoses, manic-depressive phases, simple phobias, etc., should be separated from simple neurasthenia, and then the element of fatigue as a cause becomes the more conspicuous.

It is well recognized that a pathological fatigue is rarely caused by simple hard work, mental or physical, unless some depressing emotional element is also present. This usually goes by the name of worry or anxiety. Some two years ago Dr. Edes published a very helpful article

emphasizing this truth and showed how the emotional stress might arise from obscure and elusive conditions. Friction, uncongenial environment, the unsuccessful or anxious striving for the attainment of ambitions, fear of criticisms, the "hurts" which a hypersensitive temperament constantly suffers in the every day experiences of life, etc., are sources, and even the monotony of work which has become almost automatic may furnish the emotional stress as the individual becomes conscious of daily effort to push himself to his task in spite of the ennui and lack of interest. The action of these depressive emotional factors depends much on what we are forced to call predisposition; where this is great the "stress" may be very hard to find, and finally be found in some condition which would seem quite inadequate, but is sufficient for this particular individual. The difficulty of prophylaxis in such cases is very great as the ordinary experiences of normal life seem to be too great a depressing influence for the weak powers of resistance of hypersensitive temperaments.

Dr. Knapp agreed with the writer that neurasthenia was not due to overwork by a healthy person and he had taught that for many years. The cases said to be due to overwork were really due to overworry, that is, to some form of emotional strain, combined perhaps with toxic or infectious influences. One factor which had seemed of some importance in young adults was the depressed emotional state due to a feeling of inadequacy or disharmony with the environment. A young man has worked hard to fit himself for a certain career, or life position, and he fails to attain the position or to meet the recognition which he imagines, or which really is, his due. He worries over this, and often becomes more or less neurasthenic in consequence. The neurasthenia is attributed to overwork in preparation for his career, but is really due to the emotional state of disappointment.

There are however a considerable number of neurasthenics who are congenitally weaklings and who go through life with a scanty supply of strength. They are typified by a case, where there was no especial strain or worry, who said: "I can do just about one thing a day." These patients can readily overdo. The ordinary routine of daily life is often too much for them and exhausts their strength, and a comparatively slight physical exertion, without emotional strain, often intensifies their fatigue and makes them neurasthenic.

Dr. Courtney referred to a certain insincerity on the part of so-called neurasthenics in the description of their symptoms and feelings.

Dr. E. W. Taylor said it seemed to him rather unfortunate to use the term "insincerity" in connection with these cases. The word at least implies a conscious effort to exaggerate symptoms and disabilities. This in his experience does not occur. Exaggeration is certainly common in the type of case of the discussion, but it is somewhat invidious to ascribe this tendency toward exaggeration to insincerity. No doubt, however, the matter is largely one of words.

He entirely agreed with what Dr. Lane had said regarding the etiology of so-called neurasthenia. He also was inclined to go still further than Dr. Lane did in ascribing the genesis of the symptoms to painful emotions. The condition popularly known as neurasthenia may unquestionably have its origin in a very simple and slight aberration from the normal which then persists and grows through habit. Dr. Morton Prince and the late Dr. Russell Sturgis have both done much to elucidate this phase of the question in their insistence upon the importance of recognizing association in the development of the neuroses. In general, it is evident that few of the conditions generally included under that head are properly to be termed neurasthenia. We

shall progress in our knowledge of these affections in proportion as the use of this term is restricted.

Dr. Webber said reference had been made to school teachers as though their work were light, only five hours, and no reason for their having neurasthenia. Rarely are the duties of a teacher ended in five hours. She must prepare for coming recitations and examine exercises of the past day, correcting papers until late at night. There is also the strain of keeping order among many young children or older scholars who are often very trying to the patience. If the teacher tries to do her whole duty she must frequently have anxiety and at times be worried as to the moral tendencies of those under her care. Also the anxiety to please master, committee, and parents is not small.

Dr. Webber agreed with what had been said about worry and anxiety being important elements in causing neurasthenia. With sufficient rest, food, and pleasurable environment, without worry and anxiety one can do almost any reasonable amount of work without breaking down. The amount will vary with the individual constitution and ability or power, but mere hard work rarely if ever causes nervous exhaustion. The strain of anxiety and worry will undermine a patient's nervous strength and the weaker ones sooner or later succumb and give out.

Dr. Walton agreed with the reader that overwork, while causing simple exhaustion, is not a common cause of so-called neurasthenia. Under this term, or psychasthenia, he understood to be included those suffering from the phobias and the tics, the insistent ideas—in other words, the *ideo-obsessive*. He quarreled with all these terms because they suggest that weakness is the essential factor rather than ill-directed activity. Asthenia hardly seems to be a happy term to apply to the incessant and insistent mental processes of the *ideo-obsessive*, or to the physical condition of the individual who is ready and anxious to walk miles to settle a doubt. The name aside, in considering the etiology of these conditions we should distinguish perhaps between the underlying cause and the exciting cause of such exacerbations as may serve to bring the individual under treatment. The underlying cause is surely the makeup of the individual, in other words, heredity; it is doubtless true that worry is the commonest exciting cause of the exacerbations, a fact which only serves to emphasize the importance of the underlying cause, for it is the makeup of the individual which renders him peculiarly prone to worry.

Dr. Knapp feared that Dr. Taylor had misunderstood the class of cases to which he referred. It was not the cases with fears and obsessions, but a class of physical weaklings, sometimes without a trace of mental disturbance, who were incapable of much physical strain. Dr. Courtney's slur on the sincerity of neurasthenics was in many instances wholly unwarranted and could be readily disproved by any painstaking study of the cases.

Dr. Bullard said that he must protest against the view expressed by Dr. Courtney that all neurasthenics should be held under suspicion and that their statements should not inspire confidence. This is most unjust to a large number of persons who are perfectly trustworthy and honest. Dr. Courtney seemed to be confusing neurasthenics with that class of hysterics in whom a certain tendency to deceive, whether voluntary or involuntary, is known to exist. The latter class is a comparatively small one. This form of hysteria has no close connection with neurasthenia.

Dr. Drew said that Dr. Courtney's observations about the insincerity of the neurasthenic's feelings and apparent beliefs are true enough to the facts, as a rule, and are additional evidence of the

mental element in the so-called "neurasthenic cases." But the remarks this evening have drifted, apparently, somewhat from the strong points well made by Dr. Lane.

He agreed fully, and put emphasis on the observed facts, that the hard workers are not the ones most likely to be afflicted with those symptoms we call neurasthenic. This is more especially true if the voluntary muscles are exercised with the brain, and most true if there is a good deal of exercise in the open air. Indeed he believed that where neurasthenic symptoms develop along with work and worry, the work is not accessory, but rather a corrective, to worry. In other words he believed that work, honest temperate work, prevents many people from becoming neurasthenic.

The fact that people who live and exercise much in the open air very rarely suffer from neurasthenia, points to the conclusion that "neurasthenia," so-called, may be but the manifestation of suboxidation, or a certain kind of toxemia. All this of course applies only as an exciting cause. He believed as much as Dr. Walton did in the important role the constitution plays, or, if you please, in the heredity of the patient as an underlying cause of neurasthenia. If he understood Dr. Lane's paper correctly this is pretty near the reader's own conclusion.

CHICAGO NEUROLOGICAL SOCIETY.

November 23, 1905.

The President, DR. HAROLD N. MOYER, in the Chair.

A Case of Tabes Dorsalis.—This was presented by Dr. Patrick. He stated that the patient had an optic atrophy, and, what was unusual, a disproportion of the ataxia between the arms and legs, and with that a very much greater impairment of the muscular sense and sense of position than ordinarily found. There was very little tactile anesthesia or analgesia in the arms, but the ataxia was exceedingly pronounced.

The gross strength was fairly good, but not uniform. The grasp was good, but not normal. The hypotonia of the muscles of the upper extremities was very marked, even to a degree that one does not often see, and the muscles so flabby as to make an appearance of some muscular atrophy. The ataxia in the lower extremities did not compare with that of the upper extremities.

The clinical features as narrated by Dr. Hecht were as follows: The maneuver of putting the heel of one foot to the opposite knee was well carried out, and when the patient raised the limbs and spread them apart the amount of static equilibrium was wonderful. There was marked ataxia of the tongue, at times greater than at others. The patient kept the tongue out, projected it, and bit it, so that it was usually sore, and wobbled from side to side. There was a flipping, involuntary movement of the fingers, at times more noticeable than at others. One of the most remarkable features in his record was the fact that he was registered at the North Western in 1894, with conditions that prevailed almost to the same degree as now. The ataxia of the tongue and the involuntary movement in the fingers, as well as the ataxia, were mentioned then. But the muscle sense was recorded intact. He had had the Argyll-Robertson pupil, and also had had a history of lancinating pains in his legs in 1899, when he was bed-ridden for several months, but never since. He had no optic atrophy at that time, but the fundi showed changes, according to the record. He had fixed pupils and sluggish accommodation. The knee jerks and Achilles jerks were less at that time. He had sensory phenomena that did not correspond with those now present. Deep sensation was normal on the arms; temperature sense was materially reduced. On the left side, in the region of the scapula, there was analgesia—not a zone, but posterior to the 4th and 6th dorsal. Dr. Hecht said that this analgesia had now disappeared, and that his tact sense was gone except in the palmar surface of his hands. The pain sense was in no way disturbed, except here and there hyperalgesic areas, that were not zonal at all, and did not show delayed painful sensation. The response to test tubes, hot and cold, was absolutely negative. The fundi had white discs and his muscle sense was disturbed in a very marked degree.

The disease began in 1892 with a numbness and weakness in the left hand. He had been alcoholic all his life. He had a chancre in 1893. He had gonorrheal infection at 22, which he thought had lasted many years. All the subjective symptoms have been in the upper extremities. There had been no sphincter involvement. There was no trouble in deglutition. One of the first symptoms for which he consulted a physician was a feeling of constriction about the chest. That was ten years ago. There was never any pain in the upper extremities. The hypotonus of the shoulders and arms had been so marked as almost to appear as an atrophy. Comment was made upon this ten years ago, when measurements were taken, com-

parison of these measurements with those taken recently showed exactly the same measurements as ten years ago. The patient feels much better, with the exception of the blindness, than he did ten years ago.

Canalization of the Sigmoid, Lateral and a Portion of the Superior Longitudinal Sinuses for Mastoiditis of Twenty-One Years' Standing, With Subsequent Re-establishment of a Temporomandibular Joint.—This case was reported by Dr. Bayard Holmes. The patient was exhibited. She was the daughter of healthy parents, and without previous sickness. She had an attack of right-sided mastoiditis when a year old. Six years later the mastoid was operated upon with complete recovery *in loco*. During the following seven years she had repeated periosteal and osteal abscesses in various parts of the body, and occasional abscesses in the neighborhood of the affected ear. When she was 15 years old an abscess appeared at the vertex, which discharged a large quantity of pus and pieces of bone, and has discharged interruptedly ever since. Dr. Holmes regarded the vertical suppuration as an extension of the suppuration from the mastoid through the sigmoid, lateral and superior longitudinal sinuses, and undertook a mastoidectomy. In the course of the operation an enormous extradural abscess was found connected with the undisturbed antrum. It discharged six ounces of pus, and the operation was interrupted for two weeks for drainage. At the second sitting the sigmoid sinus, the lateral sinus and the superior longitudinal sinus as far as the vertex were opened by a canal cut through the skull, 2 cm. wide externally and .75 cm. wide at the bottom. The skin flaps were turned into the canal and the sinus drained throughout its whole extent after the method suggested by Kocher for long bones. The external auditory meatus was opened at the same time and connected with the antrum, in which a flap of skin was implanted. The wound healed in a remarkably short time, and a year and a half later the temporomandibular joint was restored, and a flap of the temporal muscle implanted between the mandible and the new glenoid fossa. The function of the jaw was restored, and the dentist was given an opportunity to preserve the previously unused teeth.

Dr. Mettler said that this remarkable case, where there was no headache, might be some slight proof of a questioned hypothesis, that when the lesion, or whatever the trouble, was limited entirely to the right brain, but very slight symptoms presented. Phelps had 250 cases, he thought, in which he very positively came to the conclusion in a very careful analysis that wherever there were brain symptoms there was undoubtedly inflammation of the left hemisphere, and in this way he could account for many surgical cases, where really large lesions caused no symptoms, whereas very small lesions in other cases gave very marked symptoms. In all of the cases with mental symptoms there was always more or less involvement of the left hemisphere, and he found where the lesion was large, or even if small, if limited to the right hemisphere, there were no mental symptoms. These statistics are certainly surprising. Three weeks ago Dr. Mettler said he had a case referred to him which he wished to detail. A physician in the far West sent him a skiagraph of a boy 10 or 12 years of age. A bullet had entered on the right side, and could be seen in the print located in the posterior part of the skull. There had been some slight hemiplegic symptoms, which passed away on account of the general improvement. No operation was thought of, but the case was allowed to go on towards spontaneous healing. The boy was going to school, and except a very temporary coma had had no mental manifestation. The question was asked what parts of the brain could that bullet have gone through to produce so little disturbance. Dr. Mettler at once thought of Phelps' cases, and the right side of the brain. That might have something to do with the latency or absence of the symptoms, and suggested the possibility in the case presented of no mental symptoms, due to the fact that the enormous lesion was on the right side.

A Case of Progressive Hemiplegia.—This was presented by Dr. Harold

N. Moyer. He said that the title was not exactly correct, because it was now, properly speaking, a case of diplegia. The motor tract on the opposite side was now slightly involved. The early history showed a pure motor paralysis of the right side, beginning with the leg and spreading up to the arm, and then the face, and if we had been fortunate enough to have had him before us last summer this would have been clearly one of the cases of progressive hemiplegia of the Mills type. It was so slated on the programme partly to again get the title before the society, and partly because it was originally as titled, although now we would have to correct it by saying it was diplegia.

The history, as follows, was read by Dr. Steffenson, who stated that W. A. L. C., age 31, married, was of English nativity, and a clerk by occupation.

The family history was entirely negative. The patient stated he was perfectly well up to three years ago; he then experienced a sensation as if an electric current had permeated the right side, coming on some time during each day, and lasting about one minute. Of late it had been more infrequent, and recently had ceased altogether.

About one year ago he noticed a slight lameness in the right leg, and about the same time weakness in the right arm and face. He found that he could not write as rapidly as formerly, and that his gait was impeded on account of a slight stiffness in the muscles of the leg.

In June last he noticed that the saliva would run out of the corner of his mouth, and that his speech had become affected, so that he was unable to pronounce words clearly. He has experienced no difficulty in swallowing or mastication.

He stated that his memory had become affected so that he did not recall recent events for any length of time; that he was unable to continuously read a book or write a letter; that he sometimes used wrong words in a sentence, and felt rather depressed a great portion of the time.

He had a soft chancre ten years ago, but gave no history nor evidence of syphilitic infection.

The examination of the patient revealed a marked spasticity in all the muscles of the right side. The musculature was not diminished in size as compared with the left side. The reflexes were exaggerated, the jaw giving a sharp response. A strong ankle clonus of 360 vibrations a minute was present in the right ankle. A quadriceps clonus could also be elicited on the right side. The cremasteric reflex on the right side was much more pronounced than on the left. There were no fibrillary tremors. The right corner of the mouth was somewhat contracted and depressed. The right face appeared mask-like and expressionless; the patient doing all his talking and expression with the left side of the face. The tongue, when protruded, deviated to the right. All the tendon reflexes of the arm were much increased.

On comparing the two sides, the musculature of the right side was found very weak, about 1-5 of that of the left side in strength. The musculature of the right side showed increased susceptibility to galvanic and faradic current. The electrical reactions were increased, but otherwise normal.

The orbicular muscle of the right eyelid was much weaker than that of the left; also the levator. The left musculature showed a slight increase in tone and reflex action. There was a spurious ankle clonus. The sensation of the entire body, tactile and thermal, was normal. The muscle sense was apparently intact. A slight Babinski sign was apparent in the right foot, but not in the left. The muscle co-ordination did not seem to be impaired. The right pupil was somewhat larger than the left, but both responded to light and accommodation.

The patient complaining of some obscure visual symptoms, Dr. William A. Peterson reported that the vision in both eyes was 20-50. The external visual field of the right eye was contracted to about 1-2, or 45 degrees. The

scope of the left field appeared normal. The temporal portion of the disc of the right eye was pale and the vessels were obliterated. The fundus of the left eye was somewhat pale, but showed no particular vascular change.

Dr. Moyer said the point to which he wished particularly to call attention was the relation of the condition. When he first made the diagnosis of hemiplegia the symptoms indicated a central neurone involvement without muscular atrophy. Otherwise he would have grouped it as amyotrophic lateral sclerosis. The later history based on the motor neurone on the one side, later involving the opposite, the speech later with some mental disturbance, would suggest a relation to paretic dementia, the symptoms being dependent on the portion of the cortex involved. Dr. Moyer concluded that the history showed there was, at least at the beginning, a progressive hemiplegia which later had some relation to the paretic manifestations.

Dr. Sanger Brown said that he thought the diagnosis of Dr. Moyer's case was warranted from the early symptoms, and yet a large number of cases of insular sclerosis began with progressive hemiplegic symptoms. These symptoms lasted for a year or two, often intermingled with some sensory disturbances. Dr. Brown thought it was not necessary to wait until nystagmus, intention tremor and scanning speech with optic atrophy were presented before making a diagnosis of insular sclerosis. In a paper published by Dr. MacIntosh reviewing the history of 80 cases, 45 showed motor symptoms only at first, and 20 sensory at first. Dr. Brown said that he would include the case under discussion among the insular scleroses.

Dr. Mix said that he had recently read articles upon eighty cases reported from Strümpell's clinic worked up by E. Müller, and 33 cases worked up by Morowitz. In the 80 cases of Strümpell the early cases were paresthetic, usually in the lower extremities, this was followed by impairment of the gait and spastic paresis. In the statistics as gathered from these 113 cases, in three fatal cases nystagmus was absent in two; scanning speech was present in one; in fact, in the whole 113 there was probably nystagmus in only 15 per cent, and the other symptom of intention tremor absent in all the early cases, and present in 75 per cent of the last cases, and only a few show the three symptoms. One point in which the two articles were in accord was the absence of the cremasteric and abdominal reflexes. They seemed to be present in the case under discussion. Dr. Mix said it was interesting in this connection to note that in America we had very little multiple sclerosis. In the *American Journal of the Medical Sciences*, Dercum states what he claims is the seventh post-mortem in the United States. Spiller and Camp gave two. In the rural districts of Germany the multiple scleroses outnumbered the tabes. The same was true of England and Scotland.

Dr. Hecht said that he had read Müller's monograph carefully, and had been watching since for the absence of abdominal and cremasteric reflexes in multiple sclerosis, and in two cases which had come under observation found them present. A like fact was also mentioned by Dr. Patrick in three or four cases. These facts were interesting, as the absence of the indicated reflexes had been dwelt upon as diagnostic.

Dr. Moyer concluded the discussion by saying that he had presented the case as one of hemiplegia, largely with the idea of provoking discussion. It brought out the question of multiple sclerosis. He said he made a rule that when in the presence of a case which he regarded as organic and could not make the diagnosis to call it multiple sclerosis, and usually the diagnosis was right. The rule was a rough and ready one, but in the few cases where it was not right the disease turned out to be paretic dementia. For a time a certain definite tract will be involved, the central motor neurone of one side; later on, the other side, and still later some mental symptoms will appear, and he was not disposed to quarrel with the diagnosis of multiple sclerosis, nor with that of paretic dementia. He thought that ultimately the case would be determined by whatever symptoms happened to develop. As to the relation with amyotrophic lateral sclerosis, if the patient had tremors

that would be the diagnosis. As to this multiple sclerosis which affects indifferently sensory and motor tracts, and at different levels, and both in the brain and cord, it is certain we get a mixed grouping of symptoms wherever the lesions happen to be. He stated further that intention tremor would not be found in a large number of cases. The reflexes happened in this case to be exaggerated, as they were in the majority of multiple sclerotic cases, but in some cases they were absent. That is determined by the particular tract affected.

Dr. Kuh said that he thought it might, perhaps, be of some interest if he reported very briefly and from memory a case seen in the last few weeks which presented considerable diagnostic difficulty, and in which the results of the post-mortem findings were most astonishing to him. The patient had been ill two weeks. He was thirty-eight years old, a telegraph operator, whose history was good excepting the fact that he went on occasional sprces. He was not an habitual drinker, but occasionally indulged in alcoholic excess. Two weeks before Dr. Kuh saw him the patient was taken with headache, violent in the frontal, less severe in the occipital region, and one night while at work suddenly, and without prodromal symptoms, developed a left hemiplegia. There were no other symptoms. This lasted about fifteen minutes, and then he was as well as ever. During the next ten days he had a series of attacks, either a left hemiplegia or a complete loss of the ability to articulate, or a combination of the two. These lasted fifteen minutes to a half hour, and disappeared without any other symptoms, excepting the headache. The family physician took him to an oculist, who found a slight error of refraction, and stated that the vessels of the disc were slightly congested. He ordered glasses, and when the patient began to use them the headache disappeared. This oculist obtained a history of syphilitic infection fifteen years before the onset of the trouble. That induced the physician to give iodide of potassium, ten drops of saturated solution three times a day, and under this treatment the patient somewhat improved. The attacks continued for ten days, and stopped for three, so that a cure was thought of by the family and physician. On the fourteenth day the patient found for the first time there was a paralysis of the right side, slight at the beginning, gradually more intense, then complete loss of speech, and paralysis of the left side. Dr. Kuh saw the patient in the evening of the fourteenth day of his illness and found the following state of affairs: Mentally the patient appeared perfectly normal, as far as one could tell; he was conscious, and he had devised a method of answering; he could indicate when he meant yes and no. The loss of speech was due to paralysis of the muscles, and not to a psychic disturbance. There was paralysis of the external rectus muscle on the one side and of the internal rectus on the other. There was some ptosis on the right side, afterwards paralysis on both sides. Complete paralysis of the tongue and of the muscles of the neck, so that the only movement of the head was a slight lateral movement. When he wanted to say yes he moved his eye in a definite direction. There was almost complete paralysis of the intercostal muscles, weakness of the diaphragm, spastic paralysis of the lower and upper extremities; he was unable to swallow and unable to control the sphincters. Such was the result of the examination. Sensation, so far as it could be tested in a man who could not talk, was normal. The temperature, which had been taken a number of times, was always found normal. On the evening of the examination there was a slight elevation of temperature for the first time, a fraction of a degree above normal. The only clew was the history of a specific infection fifteen years before. The danger in the case was so great that the patient was removed to the hospital, and vigorous anti-syphilitic treatment started at once. During the first day there was some improvement, as far as the paralysis was concerned. At the time of the first examination there was marked increase of the deeper reflexes of the upper extremities. There was also well marked ankle clonus on both sides. During the first three days there was a slight differ-

ence in the size of the pupils, but the pupils always responded to light and accommodation. The temperature slowly rose, and by the fourth day reached 102.2 degrees. By evening it was 104 degrees. The next day it was 105 degrees. There was no distinct evidence of broncho-pneumonia. Respiration had increased by this time to 64 per minute, with the temperature still rising. The last temperature ante-mortem was 109 degrees, and five minutes after death the thermometer registered 110.1-2 degrees. Such was the clinical picture, and the society was asked to make a diagnosis. A tentative diagnosis of pontine softening was made.

Dr. Kuh said that the very astounding result of the post-mortem was that it was a case of serous meningitis. All the signs and symptoms were in every detail the very opposite of what one would expect. There was no softening of the pons. The only changes in the blood vessels found was a small patch of arterio-sclerosis, or sclerosis of one of the veins, but the arteries, so far as could be made out macroscopically were perfectly normal. Serous meningitis, pretty general, partly basal, was evident. The ventricles were a little larger than normal. There was some clouding of the membranes and considerable increase of the cerebro-spinal fluid; a large quantity escaped to the dilated ventricles.

Dr. Grinker said that he had had occasion to go over the paper of Quinke describing serous meningitis based on observation extending over several years, and including a number of cases, and that among these he described he had failed to find a single case of high temperature. Several had some temperature, but not one had 109 or 110 degrees. At any rate, after noting his observations in detail, Quinke came to the conclusion that one of the distinguishing features of a serous meningitis was a temperature not excessive. In Dr. Kuh's case there was a recession of symptoms. They came intermittently. They may come very rapidly; the various attacks may follow very closely or may even occur in intervals of a year, or two or three, certainly extending over months. A remarkable feature in this case was that the symptoms were stormy; that it had come on like an acute, not a serous attack, and was remarkable if an uncomplicated serous meningitis. Some pathologists do not recognize serous meningitis as a disease entity. The very high temperature can be explained hypothetically by the pressure of the fluid in the medulla over the fourth ventricle or thermogenic center, but Dr. Grinker believed a careful anatomical examination would reveal more than a serous meningitis.

Dr. Bassoe was inclined to think that high temperature might be possible in serous meningitis, and said that he had seen a patient with a temperature of 109 degrees, and at the autopsy practically nothing was found except an increase of cerebro-spinal fluid and some atrophy of the cortex of one hemisphere. There was nothing that could be called a meningitis. It was more an edema. On a gross examination of the brain nothing else was found. This patient did not give a history of any excessive alcoholism. Another patient in the County Hospital had undoubtedly delirium tremens, and his temperature went to 110 degrees before he died. At the autopsy nothing was found to account for the temperature except the edema of the brain usually found in chronic alcoholism.

Deriscope

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8. The Disturbance of Writing and Speech Resulting from the Sensible Nerves of the Head, Together with Paralysis of the Upper and Lower Extremities. URBANTSCHITSCH.
9. Contribution to the Casuistry of Multiple Sclerosis of the Brain and Spinal Cord. DINKLER.
10. Acute Transverse Myelitis. DINKLER.
11. Tabes and Taboparalysis in Childhood, and During the Age of Development. HAGELSTAM.
12. The Cremaster Reflex and the Superposition of Reflexes. STEINER.
13. Casuistic Contribution to the Knowledge of Tumors of the Cervical Cord and Medulla Oblongata. v. RAD.
14. A Peculiar Form of Familiar Muscular Atrophy. BRASCH.
15. Brief Communications. (1) A Case of Juvenile Tabes; Contribution to the Differential Diagnosis Between Gastric Crises and Periodic Gastroxynsis. KNAPP. (2) A Cyst of the Spinal Dura Mater Simulating an Extramedullary Tumor, with Successful Operation. SCHMIDT. (3) Peculiar Disturbance of the Power of Localization in a Case of Brown-Séquard's Paralysis. SCHMIDT.

8. *Disturbances in Writing.*—A series of cases have been described in which patients suffering from pareses and tremors of the extremities, with disturbance of gait, have been improved by the treatment of a co-existing disease of the ear. Urbantschitsch reports two such cases, one in a woman of sixty, who had pareses of the upper and lower extremities, tremor of the hands, and a peculiar disturbance of gait. There was bilateral otitis media, and when this was relieved the patient recovered. The other case was a man in middle life who had a peculiar swaying gait, apparently due to weakness of the feet. It was improved as a result of treatment of the middle ear condition. Urbantschitsch has also studied the effect of ear disease upon the handwriting. He mentions several cases in which this occurred, and then reports his experiments upon fifty cases in which it was possible, because of operation or perforation of the ear drum, to exert pressure upon the side of the tympanic cavity. In eleven cases there was very distinct alteration in the handwriting, and in four of these tremor was produced. In thirteen of these fifty cases the pressure produced impairment of speech, and in three there seemed to be some improvement. It appears that the production of the "s" sound is the one most frequently affected. Occasionally pressure in the external auditory canal produced disturbance of speech. Occasionally, in cases of middle ear disease, there have been distinct signs of aphasia before the operation. A series of cases is also reported in which a variety of supposedly reflex pareses were present, and in which treatment of the ear condition caused improvement. Also the case of a boy of twelve who had suffered from Ménière's symptom, occurring every other morning for two years. A single inflation of the middle ear produced cure. Urbantschitsch has also observed peculiar changes in the touch and temperature senses in various cases of middle ear disease, and has studied these changes in some of the cases available for experimental work. He notes that sometimes after removal of the pressure it requires a number of seconds before sensation returns to its normal condition. In one instance in which there was left-sided purulent catarrh of the middle ear with diminution of the touch and temperature senses on

the left side of the face, and the left lower extremity, the sensory phenomena became normal when the middle ear was cocainized. Occasionally asthenopia has been observed. It may be due either to influence upon the sensory nerves or to pressure changes in the labyrinth.

9. *Multiple Sclerosis*.—A woman of the age of twenty-five felt symptoms of spastic paraplegia. This continued almost unchanged for about eighteen years, when suddenly almost complete motor paralysis of both legs, with bed-sore and disturbance of the sphincters, occurred. Sensation was not impaired. The arms remained without motor or sensory disturbance, in particular no intention tremor was observed. There was slight paresis of the right internal rectus, and a temporary pallor of both papillae. There was no nystagmus. At the autopsy multiple sclerosis of the brain and spinal cord was found. Dinkler has apparently been able to determine some features of the histology of this process. It begins with fatty degeneration of the myelin sheathes, then proliferation of the sheath of Schwann, with an onion-like arrangement of the new-formed cells. Later there may be either hyalin degeneration of the whole nerve fibers and new-formed cells, or there is an actual tumor-like formation of the hyperplastic process. These tumor-like processes were found chiefly in the posterior roots. The cause is atypical, both clinically and pathologically.

10. *Transverse Myelitis*.—A man of thirty-six had increasing pain in the back, and three weeks later became paralyzed in the legs. The paralysis was more pronounced in the left than in the right leg. There was incontinence of urine. When examined touch and localization were lost in the left leg; pain and temperature were normal; no disturbance in the right leg. The patellar reflex was increased on the right, and diminished on the left side. The Babinski sign was present on the left side. The left lower abdominal reflex was not present. There was atrophy of the muscles of the left leg, improved on counter-irritation. The cause was probably exposure to cold. A boy of seventeen, after typhoid fever, developed intense pain in the shoulder blades, back and legs. There was not much paralysis, the reflexes were normal; there was only hyperesthesia in the lumbar region. No other disturbance of sensation was present. The patient improved on counter-irritation. A man of thirty-four had a sensation of pressure in the region of the stomach. Later there was girdle sensation, paralysis of the legs; no disturbance of sensation; diminution of the tendon reflexes in the legs, with Babinski on both sides. Later he developed hectic fever; the tendon reflexes became active; there were repeated chills; persistent priapism, and symptoms of intramedullary abscess developed. The examination of the spinal cord was negative. The patient, however, continued to grow worse and died. An abscess of the appendix was found which had extended into the pelvis. There was myelitis in the dorsal region. The diagnosis of myelitis at the level of the ninth dorsal segment was confirmed by the microscopical examination.

11. *Tabes in Childhood*.—Hagelstam has found forty-two cases of infantile tabes reported in the literature. He adds to these three of his own, and obtains the following statistics: Males, 16; females, 29. In more than 25 per cent. of these cases tabes, general paresis or cerebral syphilis was present in the father or mother, and a couple of times, in both parents. In 86 per cent. there was neuropathic heredity. His own three cases occurred in a boy of eighteen, a boy of sixteen, and a man of twenty-one. The first case, with probable syphilitic history in the parents, had characteristic tabetic symptoms. There were also cerebral symptoms, indicating the development of general paresis. The second case had neuropathic heredity, but syphilis in the parents could not be determined. The tabetic symptoms were somewhat atypical. In the third case, there were evidences of hereditary lues and characteristic tabetic symptoms. Hagelstam believes that infantile tabes develops upon either hereditary or early acquired syphilis. Neuropathic heredity is much more common than in adult tabes. Females

are more frequently affected than males; and there is no sharp line of demarkation between the infantile and adult forms.

12. *Cremasteric Reflex*.—Steiner investigated the cremaster reflex in ninety soldiers. He found it present in 82, doubtful in 38 and absent in 5. In two of the cases in which it was absent, and two of the doubtful cases, Geigel's inguinal reflex was present. He believes that we can only speak of the absence of the cremaster reflex when the inguinal reflex is also absent. Therefore, in 97 per cent. of healthy young men the cremaster reflex is present. The reflex may be excited psychically by threatening to prick the skin of the thigh with a needle. Fatigue of the reflex is not pronounced. The cutaneous area over which the reflex can be elicited usually includes the inner and anterior surface of the thigh from the groin to the knee. In regard to the relation between the cremaster and the inguinal reflexes, he believes that they have separate centres, because he was able to observe one case in which they were distinct when elicited by irritation applied to different parts of the thigh.

13. *Cervical Tumors*.—A man of thirty-four had pain in the neck, radiating to both sides; then stiffness and impaired motility of the head, weakness, and finally paralysis of the muscles of the right shoulder, and weakness of the right arm. Later the right leg was involved; then the left arm, beginning with the shoulder. The tendon reflexes were all increased; there was patellar and ankle clonus, but no Babinski; and the skin reflexes were not involved. Romberg's symptom was present. Sensation was slightly diminished in the left arm and leg. The pain became unbearable; there was disturbance of swallowing; and finally death. At the autopsy a large tumor was found involving the medulla oblongata, and the upper portion of the cervical cord. This proved to be a glioma. There was also descending degeneration of the pyramidal columns of the cord, more pronounced on the right side, and some diminution in the density of the fibers in the central portion of the posterior column. Von Rad discusses the differential diagnosis. During life intramedullary tumor of the cervical cord was strongly suspected, but an extramedullary growth could not be excluded.

14. *Familiar Atrophy*.—Brasch reports two cases of the familiar type of hypertrophic neural muscular atrophy. Altogether four members of the same family are known to have had the disease, the grandmother, the father, the patient and the patient's cousin. The earliest symptoms apparently appear in childhood. The patient was forty-five years of age. There was muscular atrophy of the type of Aran-Duchenne. A pronounced Romberg's symptom was present, and there was bilateral *pieu en griffe*. The gait was typical stepper, uncertain and ataxic. The pupils were myotic, reacted to accommodation, but not to light. The disturbance of sensation involved only the sense of touch and was comparatively slight. The electrical reactions of the nerves and muscles involved in the atrophy were either greatly diminished or lost. The peripheral nerve trunks were not tender, but many of them appeared to be thickened and very easily palpable. The second case, the father, seventy-four years of age, with markedly diminished intelligence. He also had myosis with failure of reaction to light. There were various muscular atrophies, bilateral pes equinovarus paralyticus, loss of the tendon reflexes, and diminution of the electrical reactions. These cases correspond closely to two reported by Dejerine and Sottas. After studying cases of this and analogous conditions that have been reported, Brasch reaches the conclusion that the Charcot-Marie-Hoffmann type of muscular atrophy is not clinically sharply circumscribed; that there is a group of cases, particularly those of Gombault-Mallet and Dejerine-Sottas, which are clinically so different that they remind one of a combination with tabes; and that the anatomical foundation of these cases is not uniform, because different structures may be differently affected.

15. *Tabes, Spinal Cyst.*—1. A man of twenty-seven had had syphilis at the age of twenty-one. Later he developed attacks of continuous vomiting with hyperacidity, in consequence of which he lost weight. He had Argyll-Robertson pupils, diminished reflexes; some delay in sensation in the soles of the feet, and a small quantity of intensely acid fluid was always found in the stomach. Later he developed ataxia with pains in the arms, legs and back. The case is one of precocious tabes with gastric crises.

2. A boy of sixteen developed pain in the back. Later there was stiffness of the legs with continuous cramps. There was a spastic condition of the legs with patellar clonus and Babinski reflex. The cremaster, and later, the abdominal reflex were absent. There was loss of sensation in both legs; voluntary micturition was impossible, and a diagnosis was made of extramedullary tumor of the spinal cord. Lumbar puncture showed diminished tension of the cerebrospinal fluid. The character of the fluid did not indicate inflammatory change. An operation was performed, the fifth, sixth and seventh vertebral arches being removed, and a cyst was found resting upon the posterior surface of the dura. This was removed entirely. The patient had a brief attack of meningitis following the operation, and then cystitis, but ultimately made a perfect recovery. The cyst appeared to be composed merely of connective tissue.

3. A man of thirty-two, at the age of nineteen, had been stabbed in the back. Immediately afterward he developed Brown-Séquard syndrome; the right leg was paralyzed, and the left leg without sensation. He improved until there was only slight disturbance of sensation in the left leg and some stiffness in the right leg. When examined thirteen years after the injury it was found that the localization sense in the left leg was very poor. There was also loss of the deeper sensibility and the sense of position in the right leg, not including, however, the hip joint. The long persistence of the sensory disturbance is the interesting feature in this case.

JOSEPH SAILER (Philadelphia).

Journal de Psychologie.

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1. Concerning the Illusion of Having Formerly Seen or Having Already Lived Through What is Now Transpiring. PIERRE JANET.
2. Heredity and Degeneracy. ETIENNE RIBAND.
3. A Case of Combined Fetichism and Masochism. GEORGES DUMAS.
4. Concerning the Simulation of Insanity. CLEMENT CHARPENTIER and PAUL KAHN.

1. *Illusion.*—Janet criticises and continues the recent discussion upon the peculiar form of illusion first described by Wigan in 1844. He takes exception to the recent views of Grasset, of Dromard and Albès, of Ballet and others. He insists that more careful study of the patients, without offering them suggestions and without being influenced by their unscientific and prejudiced accounts, will lead to a better comprehension of the phenomenon, than all of the attempts now being made to concoct a psychological theory upon these confused and garbled accounts.

Wigan's formula, which Janet says has been so unquestioningly adopted by patients and psychologists, is as follows: "There is a sudden impression that the scene in which we have just taken part (though being given the circumstances, it is recognized that it could not have occurred formerly) has already appeared before our eyes in some previous time, with the same persons conversing, seated in the same positions and expressing themselves in the same terms. The attitudes, the expressions, the gestures, the tone of the voice, seem to be all recognized and to draw our attention to them for the second time." It is upon the basis of this formula that all of the psychological hypothesis are built. Janet believes that the formula itself is radically wrong in leading to the inference that the phenomenon

is a fault of memory and is due to the imagination. The formula is constructed solely from the descriptions of the patients themselves, and these are notoriously unreliable; hence a closer and more rigid study of the patients themselves is needed before any psychological hypothesis is elaborated. As a result of such rigid study—such a study as one would make of a hysterical patient, excluding all possibility of suggestion—Janet notes both in the manner and language employed, agitation, doubt, confusion and contradiction. Furthermore, these patients exhibit unintelligibility, incapacity, indecision, uneasiness, automatism, domination, indifference, restlessness, depersonalization, etc. They say they see something that is unreal; they declare in the same breath that the like has never been witnessed, and yet they have already observed it before; they sometimes affirm that it seems as though they were in another world, having died and resurrected. The illogical, contradictory character of such assertions is obvious, and from this Janet postulates that there is a thread of negation running through all phases of this phenomenon. "The essential trait of the phenomenon is much more in the nature of a denial of the present than of an affirmation of the past."

Two great problems are involved in the study of this mental disturbance. The one is *psychological*; the other is *clinical*. The psychological problem involves one of the highest of the cerebral functions; namely, the function of "presentification," which consists in rendering present to the consciousness a particular state of the mind and a particular group of phenomena. Up to the present this question has been very little studied. The disturbance of this function, "the function of the real," underlies, according to Janet, the mental symptom or illusion under discussion. The clinical problem involves a search for the conditions in which this "function of the real" is changed, whether in an acute or in a chronic manner. These conditions will be seen to exhibit what have been called attacks of psycholepsy. During one of these attacks, objects appear in the external world with their usual shapes and colors, and provoke sensations of touch, or at least certain sensations of movement. These sensations, Janet always found to have been normal, and only upon pure hypothesis could they have been spoken of in any way as profound alterations of the general sensibility. Even the patients recognized the normality of these sensations. On the other hand the patients did not experience in these sensations their usual force, complexity, liveliness and systematization. There was a weakening or poverty in the mentalization of the moment, a partial denial, as it were, of the present. As a result there occurred a revival of some memories, which memories, however, did not possess their habitual characteristics, such as the awakening those associations of ideas which would lead on to a completion of the perception; as for instance, the guessing the physiognomy of a friend whose back only was seen. Thus Janet simplifies the whole problem for himself by basing the illusion upon that common condition wherein normal or pathological abstraction suppresses partially present representations and opens the door to residual past representation. For this reason he believes that for the present the clerical observation of the symptom in its totality is of far greater importance than is the psychological interpretation of a particular manifestation isolated thus by abstraction.

2. *Heredity and Degeneracy*.—It is difficult to abstract this article, as it is a long historical and argumentative essay, taking exception to some of the current views upon heredity, degeneracy and their interrelationship. The author concludes that "similitude is the very essence of heredity." It acts the same in the healthy as in the diseased individual. Fundamental similitude by continuity of substance, however, does not necessarily persist. Successive adaptations, arising in the course of embryonic development modify the organism and make of it a characteristically defined being, presenting dissimilarities from its progenitors when simultaneously compared.

Always well marked, these dissimilarities become accentuated along the lines of degenerative blemish, because external forces exercise a very ready influence upon them. There is only a difference of degree, sometimes very slight indeed, whereby, not the continuity of the hereditary force, but the adaptive reaction of the given substance is affected. These reactions, which create the dissimilarities are exactly the opposite of heredity, as much for the healthy as for the diseased individual. There is no need of searching for the differential characteristics of a morbid heredity as opposed to a physiological heredity. A reflective analysis of the phenomena leads to the necessary conclusion that heredity implies similarity. The dissimilarities do not occur as the spontaneous and necessary products of degeneracy, but as the result merely of certain incidental actions. If we no longer regard these dissimilarities as hereditary we will begin to search for their origin in order to draw, if possible, some practical conclusions from them.

3. *Case of Fetichism and Masochism.*—After defining fetichism and masochism briefly and taking exception to the view that these mental disorders are but gross manifestations of normal tendencies, Dumas presents a long and detailed account of a case. The patient, whom he calls Bertrand, is to-day forty-five years of age, mild mannered, almost timid, and full of regret at the misdemeanors which his passion has prompted him to do. He seems and is an honest and upright man. His father was an alcoholic; one of his brothers is a drinker and dissipated; a sister is feeble-minded. The patient has complete atrophy of the left testicle, which probably contributes to his sexual impotence. He has manifested at times typical hysterical symptoms. His infancy was sad and depressed, his mother dying when he was eighteen months old, and a stepmother treating him badly. At thirteen years of age he had to work for his living; at twenty he entered the military service; passed some five years out in the colonies; was liberated, and at the age of twenty-six became a conductor upon a railroad.

At eighteen years of age he was chaste and innocent. He was so ignorant of sexual affairs that he did not understand the advances made by a prostitute somewhat older than himself. At eighteen and a half years of age he attempted intercourse upon the advice of some friends, but failed. At twenty-five his *vita sexualis* seemed to awaken. He married at twenty-seven, had a son, and until he was thirty-two possessed a moderate degree of sexual vitality. Then he suddenly lost his sexual power, and his wife thereafter was no more to him than a beloved sister. Thus the couple lived for six years, when the wife was seized with an attack of melancholia and sent to an asylum. The separation greatly depressed the patient. He sent his son away and gave himself up to solitude, alcohol and thoughts of suicide. He was still further saddened some four years later by the confinement of his wife, who had been violated by another inmate of the asylum at a moment when the watch was relaxed.

Though physically impotent, he still preserved in his memory, almost like an obsession the pictures of his former sexual activities. During the years of impotence, while he was still near his wife, he did not suffer from any such mental obsessions. He then seemed calm, strong and well, though devoid of sexual emotion; now, however, in his solitude he felt nervous, weak, in need of stimulation, and especially subject to harassing and imperative thoughts of sexual excitement. During his impotent conjugal years he experienced horrible dreams, wherein he was chased by all kinds of fierce beasts, to escape which he fled precipitately. Sometimes he would come to a precipice and leap into the fires burning below. When his horror had seemed to have reached its climax, when he was being roasted by the flames or torn by the beasts, he would awake from the pain and have a complete sexual orgasm. For the next few days he would suffer some distress in the lumbar region, but would become calm and remain so until the next crisis. These masochistic dreams continued with some respite

until he was placed in the asylum. He often tried to avoid these dreams by delaying the hour of sleep, but it always ended by his sleeping and dreaming them.

Bertrand was a masochist without knowing it. Ere long he discovered how to bring on the masochistic orgasm by voluntary means. The discovery was accidental. One day, while arranging the garments of his wife he took up her drawers, and affected with the odor of the skin and sweat, he experienced a local sexual excitement. He learned nothing further, however. In order to avoid his fearful dreams he attempted again intercourse with a woman, but at the moment of the trial he found himself still impotent. Not so, however, when he utilized some garment of his wife. When he felt that he was approaching the time for one of his dreams he endeavored to head the latter off by wearing his wife's corset, her stocking, her drawers or her chemise. He then felt no longer alone. He locked these objects against his heart as he would have done a woman. He had the image of a woman before his eyes. He attained a state of happiness the moment he began to lose consciousness in sleep. 'Never could he realize his degree of happiness during the waking state. The first effect of these fetichistic emotions was the banishment of his terrible dreams. He resorted to these measures some six or seven times a month. In the intervals he remained calm, but melancholy.

At length his wife's linen lost its power for him, and the masochistic dreams began to return. Then the patient, to avoid these dreams in which the flames and the beasts all reappeared, took thought of stealing the garments of some woman. As conductor he had ample opportunity in the baggage car. He yielded to the temptation, and finding the result all he could desire he stole many things and often. This preyed upon his conscience and rendered him intensely depressed. Yet he could not resist the crime, so imperative seemed to him to be the need. All sorts of articles were purloined. Finally he was detected and arrested. While he was stealing thus he was also gratifying his passions by sticking himself with various sharp instruments. He discovered the effect of this manoeuvre for the first time, when he had, a long time ago, gone with his wife to a doctor, who mentioned a possible treatment by means of hypodermic injections of the testicular fluid of the rabbit. He tried the experiment upon himself, sticking himself through the female garment he had on (masochism and fetichism). The injections were then gradually increased and finally all sorts of sharp instruments were used to mutilate himself and to provoke the orgasm.

When the patient was arrested, to the utter amazement of those who searched him, he revealed himself completely clad in female garments under the outer dress of a man. He had on a corset, long stockings and a chemise. He was declared irresponsible by a medical expert and sent to Saint Anne, where for a number of weeks he was under the care of Magnan.

The author follows the description of the above case with several pages of psychological analysis and theorizing along the lines already laid down by Krafft-Ebing and Janet.

4. *The Simulation of Insanity*.—Ball, Ingegneros and others affirm that simulated insanity may be distinguished from genuine mental disease by the exaggeration, illogicality and absurdity exhibited by the simulators. They overdo it. Charpentier and Kahn declare this is not always the case, and in proof of their contention they present the history of a girl who simulated hysterical kleptomania to such a perfect degree that medical experts pronounced her insane and sent her to the asylum. Here she was discovered to be nothing but a shrewd, common thief, without the alleged neuropathic family taint or any signs of the slightest degree of mental aberration. As a common thief she had been arrested, and while in prison had studied assiduously so as to reproduce in every detail the

motives, the symptoms and the usual after-effects exhibited by a kleptomaniac, the pages of a medical book surreptitiously conveyed to her by an accomplice.

METTLER (Chicago).

Miscellany

ACROMEGALY. D'Orsay Hecht, Chicago (Journal A. M. A., Nov. 4).

The author reports a case of acromegaly in a young woman aged 24, which is of interest in presenting a family history of tendency to malignant disease. There were persistent headaches since childhood and the appearance of the acromegalic symptoms followed severe mental strain and typhoid fever. The headaches were unrelieved by glasses which had been worn for ten years for myopia, and the pupils presented the anomaly of being small and unaffected by light, accommodation or mydriatics. This prevented the thorough examination of the fundus which, however, apparently showed no peculiarities unconnected with the existing myopia.

CAMP.

PSEUDOSCLEROSIS (DIFFUSE SCLEROSIS. C. S. Potts and W. G. Spiller, Philadelphia (Journal A. M. A., Nov. 11).

The authors' review the literature of the so-called pseudosclerosis of Westphal and report a case, with autopsy. They reproduce Frankl-Hochwart's diagnostic comparison of the two types of pseudosclerosis and diffuse sclerosis and point out their clinical resemblance. Their pathologic similarity is even closer, as Dr. Spiller shows in his pathologic report, and remarks on the case. "It is evident," he says, "that sharp distinction between the findings of pseudosclerosis and those of diffuse sclerosis can not be made, and that the differences are probably chiefly in the degree of the alteration and not in the character of the alteration. The unusual firmness described in some of the cases of pseudosclerosis must be caused by a proliferation of the neuroglia, even though this proliferation can not be detected by the microscope." The case reported, he says, may be regarded as one of pseudosclerosis, or at least as a transitional form. The pathologic diagnosis was hardening of the brain and cord, chronic diffuse nephritis, gummata of the liver, acute serous pericarditis, and fibrinous pleurisy.

CAMP.

DEATH BY ELECTRICITY.

The *Deutsche Med. Zeitung*, No. 73, has a paragraph referring to two deaths caused by contact with a "live" electrical wire. The chief interest lies in the declaration that such accidents are not necessarily fatal, and the opinion that the first case would not have been fatal if artificial respiration had been properly performed and persevered with. A youth of 16, strong and healthy, just to amuse himself, thoughtlessly touched a wire that ran into ground and that generally was not alive. Occasionally, however, a current of 500 volts ran through it, as its use was to carry a current to earth on occasion of some break in the insulation. He first touched the wire with his finger tip, then with the whole of the right hand without saying anything—and it is supposed, without feeling anything. He laid hold of it again and immediately called out, was seized with convulsions, and fell against the wall. Several minutes elapsed before he could leave go of the wire, and on doing so fell down unconscious, but still breathing feebly. The bystanders attempted artificial respiration, but no medical assistance was sent for. The autopsy showed no burning of the skin, a comparatively bloodless brain without edema, several petechiæ on the heart, moderate fulness of the right heart, tenseness of the vessels behind, filling of the large vessels with fluid and clotted blood, moderate frothy edema of the lungs, nothing characteristic, in short, except the signs of suffocation.

It was ascertained that immediately after the tragedy the wire contained no current. It was assumed among the technical experts that the accident was due to a so-called "vagabond current," such as sometimes branched off from the main current in wet weather.

The author was convinced that with artificial respiration properly conducted under the direction of a medical man, the boy's life might have been saved, in the same way as in a case pointed out by D'Arsonval, where a man who had received a current of 4,500 volts, and who had been unconscious for hours, was saved.

The second case was that of an electrical artificer, who by coming carelessly into contact with a transformer and not in the regular current circuit, but near to it fell forward with a cry of pain and was dead. The autopsy showed burns on the arm affected, bloodlessness of the brain, a good deal of edema of the pia mater, a flaccid empty heart, and excessive hemorrhagic edema of the lungs. In this the cause of death was cardiac and not from suffocation. In both cases the wire in question was not protected by insulation. The author points out that in all parts carrying a high tension current efficient insulation should be demanded. JELLIFFE.

PERIODIC PARALYSES. G. E. Holtzapple (Journal A. M. A., Oct. 21).

The author refers to the literature of this subject and gives an interesting account of a family of which he had the record of for four generations and had observed for twenty-two years. Seventeen of the members of this family had the typical periodic paralysis, six of them dying in an attack. A number of others were sufferers from migraine. The attacks were of the characteristic type, the severer ones involving all the muscles except those of the face, eyes, tongue, the organs of speech and deglutition, and the rectal and vesical sphincters. Others were more or less permanently crippled by the disease. The pathology of the condition is discussed, the author being inclined to consider it as a vasomotor neurosis affecting the blood supply of the anterior horns, which are supplied almost wholly by the anterior spinal artery. The slow progressive permanent paralysis which occurred late in life in two of the cases reported, he thinks is due to slow degeneration of these horns from the frequent disturbances of nutrition. The paralysis in these cases seems to him to be closely allied to the local paralyzes accompanying migraine, and thinking that there might be an active toxin from the gastrointestinal tract at work he made careful urinary examinations in six of the paralytic cases, in three of those suffering from migraine, and in five of the healthy members of the family. The average quantity of urine voided in all the average output of urinary solids appeared to be the same. There was, however, a noticeable difference in the urea elimination in the paralytic individuals and in these directly after the attacks. It appeared that these patients do not excrete the normal quantity of nitrogenous metabolic products. It will require further observations to determine the exact degree of relationship, if any, between the diminished urea excretion and the paralysis. With the idea that the attacks were due to a vasomotor spasm he resolved to try large doses of bromid, preferably of potassium, 5ss, with one or two grains of citrate of caffein repeated in one or two hours. This gave decided relief, and helped to abort the attacks; small doses were never tried. CAMP.

BRAIN INJURIES. D. C. Peyton (Journal A. M. A., Oct. 14).

Peyton points out the indications for operative interference in cases of brain injuries. He holds that surgery is called for when there is evidence of hemorrhage or symptoms of compression, either from hemorrhage, depressed bone, or the presence of a foreign body, and emphasizes his opinion that in cases with symptoms of serious brain injury the danger to the patient of an exploratory opening with the observance of the highest degree of aseptic technic, is infinitely less than the unreasonable delay that is frequently permitted while waiting for definite diagnostic symptoms. He urges the importance of the surgeon watching the symptoms very closely from the beginning until he can assure himself that no injury has occurred within the cranial walls. Two cases are reported, one of gunshot wound with extensive comminution of bone in which the fragments were removed and

the wound cleansed by irrigation with normal salt solution, followed by recovery; and the second, fracture of the base, terminating fatally.

CAMP.

DIONIN. W. H. Snyder, Toledo, Ohio (Journal A. M. A., Nov. 18).

The author says that he has been unable to find any reported experiments bearing on its action on tissues and cells, and cites his own, in which the drug was applied directly to the eye of a rabbit in larger quantities than would be required for an abnormal eye. Sections were made of enucleated eye and the findings noted. He concludes that the action of dionin is purely local, its most marked effects are in eyeballs in which tension is increased, and he believes its entire action can be explained by saying it has some disassociating action on the intercellular cement substance, allowing a transudation of serum from a globe under pressure. Its analgesic effect is explainable by its lessening of tension and by the well known action of the derivatives of opium. He believes that it is only a lymph stimulant secondarily, after the edema the fluid is absorbed as lymph, as it would be in edema from any cause. He reports a case of complete absorption of the iris, lens and capsule under the use of dionin in a case of severe contusion of the eye without penetration. In iritis with adhesions and plus tension, it lessens the tension and permits absorption of the mydriatic with resulting relief of pain and dilation of the pupil. In corneal ulcers, especially of the peripheral type, the repair process begins as soon as the ulcer is cleared. The more recent the inflammation and the higher the tension the better the results from dionin, according to Snyder's experience. In recent cases of corneal opacity he has had good results, but little or no benefit in old central opacities with low or normal tension. He has tried it in conjunctival hemorrhage without special success, the pressure element being evidently lacking. In beginning pannus, his experience has been more satisfactory than with any previous treatment, the lid of course being treated for the cause. In glaucoma he prefers dionin to eserine, relief from pain being marked, due, he thinks, to the mechanical relief from pressure. He early abandoned the use of solutions and now applies the powder directly to the cornea with better results.

CAMP.

MANAGEMENT OF EPILEPSY. Thomas P. Prout (Amer. Med., July 22, 1905).

The author says that the proportion of epileptics in the United States is about one to five hundred. He believes we are now at a time when the known facts regarding epilepsy can be made available and put to the fullest use by every general practitioner. The most important drugs in the treatment of epilepsy are the bromides, their use depending upon the recently established fact that preparations of the bromides locally applied diminish cortical irritability. The author believes that the so-called hypochlorization method of administration, introduced by Toulouse and Richet, is a great advance. This method, briefly, consists in the substitution of sodium bromide for sodium chloride in cooking and at the table, though many patients under this method were found to be particularly susceptible to bromide intoxication. The author says that a preparation of special value in the treatment of epilepsy is bromipin—a 10 per cent compound of bromine in oil of sesame—of value especially because of its non-irritating qualities. Its slightly laxative effect is a distinct advantage in those cases in which constipation is the rule; especially is this condition true of children in many of whom constipation is a very troublesome symptom. Further, if the patient is poorly nourished, bromipin has the qualities of the fats in general in supporting nutrition. It may be emulsified and flavored with peppermint or wintergreen if there should be serious objection to its taste.

CAMP.

THYROID DISEASE IN CALIFORNIA. H. C. Moffit (Journal A. M. A., Sept. 16).

The author writes interestingly on thyroid disease in California. Observation has convinced him that thyroid disease is more common in San Francisco than in many other States, and he has studied the subject by cor-

respondence with other physicians throughout the State. Goiter is more common, especially about San Francisco Bay, and less frequent in the Southern part of the State and in the mountains, and is endemic in certain portions of the Northern section. Myxedema seems to be more frequent in San Francisco, perhaps because most patients drift there. He has reports of 53 cases in that city and 33 throughout the State, excluding *formes frustes*, of which he has notes of 11 cases. These are characterized by dry skin, scaling of the scalp, thinning of the eyebrows and loss of hair from the neck and in the axillæ, pains in the knees and ankles and between the shoulders, and fat pads about the upper back and clavicle are characteristic. Of sporadic cretinism, he has collected 61 cases altogether, 35 of them in San Francisco. Exophthalmic goiter seems to be much more common in Bay counties than elsewhere in the State, and he remarks on the danger of the use of the iodine preparations, especially when a goiter exists, however small. He has had several cases of iodism in patients with small goiters, and he suggests the possibility of the strong sea winds in San Francisco affecting the frequency of cases. The therapy of thyroid conditions is discussed at some length. The reports as to thyroid medication in myxedema and cretinism are enthusiastic; large doses are not required, and they may produce unpleasant symptoms in myxedema. He has seen good results in exophthalmic goiter from long-continued faradism. He thinks many cases of exophthalmic goiter are amenable to surgery, and that more attention should be given to the statement of Horsley that division of the isthmus alone leads to retrogressive changes and shrinking in the rest of the gland.

CAMP.

SUTURE OF THE SPINAL CORD. George Ryerson Fowler (Annals of Surgery, October, 1905).

The patient, a male, aged eighteen years, suffered a gunshot wound of the back, from a .38 calibre revolver, one and one-fourth inches to the right of the median line and on a level between the tenth and eleventh dorsal spines. Immediately symptoms of shock and complete paralysis below the waist attained. Sensation below the level of one inch above the iliac crests on the sides and midway between the umbilicus and symphysis in front was lost. There was incontinence of feces and twitching of the muscles of both legs, especially the toes. A laminectomy of the tenth, eleventh and twelfth vertebrae was done ten days later, and the bullet, observed by a blood clot, found lying transversely between the severed ends of the cord. Only a ragged strip of dura remained intact. The ends of the cord were brought together with fine chromic catgut. Three weeks after operation the following symptoms were present; anesthetic area reduced from one and one-half to three inches; twitching of the toes and occasional clonic spasms of flexors and extensors of thigh; no control of bladder or rectum, but sensation of distention in either present; cremaster and patella reflexes and ankle clonus absent; Achilles jerks and Babinski's reflex present on both sides. During the next few months the patient developed bed-sores and cystitis, and some time later passed through an attack of lobar pneumonia. A year after the operation the bladder and rectal sensation was found to have undergone decided improvement, and this continued during the ensuing year; both legs spastic and useless for locomotion; the line of anesthesia crossed the body about one and one-half inches above the pubes in front, and was represented in the back by a curved line one-half inch below the iliac crests. Above the line of anesthesia there was a zone of hyperesthesia about two inches in width. There was slight atrophy of both legs and marked atrophy of the glutei, probably from disuse. The skin was dry and scaly. Six months later an examination revealed practically the same condition, except the anesthesia extended no higher in front than the pubes. This case is of interest in that it relates to possible spinal cord regeneration following late repair of traumatic division. Twenty-six months after injury there was practically no return of function to the area involved.

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COWLES (New York).

Book Reviews

LE MECANISME DES EMOTIONS. PAR DR. PAUL SOLLIER. Felix Alcan, Paris.
P. Hoeber, New York.

This volume consists of a series of lectures given by Dr. Sollier at the new university of Brussels in the year 1903. It is composed of five chapters in 302 pages. These chapters concern themselves with the topics: Emotionalism and the Emotions, Evolution of Emotion, Sensibility and Emotion, Cerebral Cœnesthesia and Emotion and Representation and Emotion. After a preliminary statement of the problem and the outlining a general view of the activity of the nervous system in general and of the brain in particular he discusses in the first chapter the elements, excitation, sensation, movement, representation and the general relations of the molecular conditions in the cerebral substance constituting the physical substratum of these elements. He then plunges into the midst of his search for an explanation of the physiological phenomena based on general biological laws. He is opposed to the general peripheral theory of the emotions, constituting the main foundations of the James Lange hypothesis and seeks to show that the emotions are primarily founded on a certain quality of emotionalism, endeavoring to establish the existence of a cerebral cœnesthesia which is of primary importance for the understanding of the emotions. He thus considers the emotions as due to a diffusion of energy liberated by internal and external excitations acting on the brain, and to the absorption or utilization by the brain of a part of the energy originally intended to be transformed into some form of muscular work, and finally an element in emotion is due to the consciousness of this diffusion of energy.

To obtain the full import of the author's ingenious hypotheses it is necessary to read the book, and such a task will prove not only profitable but enjoyable as well, as it has a plausible and convincing style.

JELLIFFE.

OPIUM, MORPHINE ET COCAINE. INTOXICATION AIGUE PAR L'OPIUM, MANGEUR ET FUMEURS D'OPIUM, MORPHINOMANIES ET COCAINOMANIES. PAR P. BROUARDEL, Professeur de Médecine Legale a la Faculté de Medicine de Paris. J. B. Bailliére et Fils, Paris.
P. Hoeber, New York.

This is a small brochure of 150 pages on the toxicological and medicolegal aspects of these important substances. It consists for the most part of a reprint of some lectures given in a course of legal medicine, and while containing little that is new, says what there is known in a pleasing and facile manner.

GOODALE.

PARALYSIS AND OTHER DISEASES OF THE NERVOUS SYSTEM IN CHILDHOOD AND EARLY LIFE. BY JAMES TAYLOR, M.A., M.D., F.R.C.P., Physician for Out-Patients to the National Hospital for the Paralyzed and Epileptic, Etc. P. Blakiston's Son & Co., Philadelphia. \$4.00.

Within a compass of 500 pages much has been included in this very excellent volume. In the introduction the author very modestly defines the work as an expression of personal opinions, modified and extended by the knowledge of the views of others on subjects which have interested him for a good many years. Among these subjects are: Meningitis, and Its Varieties; Paralysis of Cerebral Origin, Intra-Cranial Tumors, Chorea and Allied Disorders, Other Diseases, including many, and Spinal Cord and Allied Diseases. These are only group headings.

The book is rather a series of studies, more or less rendered into a continuous discussion. The different topics being dealt with, at times rather cursorily, again very exhaustively, apparently in accordance with the personal experience or inclination of the writer. Even in the more general descriptions, however, thoroughness is characteristic, but a certain scrappy character is nevertheless apparent. This gives the book an eminently descriptive tone, and as such it is highly valuable, particularly for clinical delineations. Were it more copiously illustrated it would prove even more valuable for this purpose.

JELLIFFE.

LES ECRITS ET LES DESSINS DANS LES MALADIES NERVEUSE ET MENTALES.
Par J. ROGUES DE FURSAC. Masson et Cie, Paris, France. Paul Hoeber, New York.

The study of pathological writing is not new, but it has advanced to the point when it might be made available as a means of diagnosis of mental disorders. Handwriting experts there have been for many years. As long ago as 1860 Marcé wrote extensively on the value of the handwriting from the point of view of diagnosis and legal medicine. Simon, Saglas and Jamin have interested themselves in the same field, and the recent excellent monograph of Köster is a contribution from the German psychopathic wards.

Köster's work has, however, all of the difficulties for the English reading public resident in the difficult German script, while many German readers are conversant with the printed language, the significance of the old fashioned script is lost. Fursac has not had to contend with this difficulty, for his French patients form their letters much as we do, and hence the numerous and excellent illustrations can teach a lesson even if their sense may not be understood.

In his introductory chapter Fursac discusses general considerations concerning pathological writing, dealing with both the form and method of its execution, as well as the sense of the ideas written. These he has, adopting Jaffray's nomenclature, designated calligraphic and psychographic, and the compound psycho-calligraphiques is a necessary consequent. Spontaneous, copied, dictated and applied writing are severally defined and discussed.

He then passes out special forms, discussing elementary troubles of calligraphy as evidenced in various psychoses. A third chapter discusses the alteration of graphic images; here the various confusions and dementias are characteristic. Defects of attention as shown in writing then follow; mental automatism, transpositions, additions, echographia, stereographia, etc., being severally illustrated.

Motor affections of writing are then taken up. The various calligraphic disturbances of paralysis agitans, exophthalmic goiter, chorea, multiple sclerosis, etc., being passed in review. The writing of the epileptic is taken up and then general paralysis. Chapters on the writing in the organic dementias, dementia præcox, alcoholic dementia, alcoholic intoxications, etc., are then described. Acute confusional states, delirea, manic-depressive insanity, neurasthenia, hysteria, the psychopaths are then discussed.

A final chapter on the drawings of insane patients closes this interesting and highly valuable volume. It is a very suggestive and scientifically valuable contribution to psychiatry.

JELLIFFE.

THE PRACTICE OF MEDICINE. BY JAMES TYSON, M. D., Professor of Medicine in the University of Pennsylvania and Physician to the Hospital of the University; Physician to the Pennsylvania Hospital; Fellow of the College of Physicians of Philadelphia; Member of the Association of American Physicians, etc. P. Blackiston's Son & Co., Philadelphia.

To those familiar with the last edition of this work, the new fourth

edition will require no word of commendation. The same completeness of detail, the same availability and practicality of therapy, the same concise and scholarly presentation characterize its pages as formerly.

The most important changes in the text over the last revision are to be found in the section upon animal parasites, and are such as have been made necessary by the recent activity in this field. These parasites are taken up systematically by class and order, and a detailed description given of each with the various pathological processes which they are capable of producing. This portion of the work embodies the results of the latest researches and constitutes as complete a symposium on this subject as is to be found in English.

A commendable feature of the book is again the vigorous and explicit handling of the treatment and management of cases. In this respect the treatises on nephritis and diabetes are notably strong. It is interesting to observe in this connection that the author, though claiming small experience, is inclined to look favorably upon Edebohl's operation for relief of chronic parenchymatous nephritis.

Mention might also be made of the adequate consideration of the applicability of serum therapy wherever its use has been suggested.

The book in its present edition stands well to the fore in medical literature, and those who have appreciated its value will have no cause to be disappointed with the result of the last revision.

News and Notes

DR. KAHLO, PHYSICIAN IN CHARGE OF FRENCH LICK SPRINGS, INDIANA.—

Dr. George D. Kahlo, Professor of Medicine and Clinical Medicine in the Indiana Medical College, the School of Medicine of Purdue University, and formerly Dean of the Central College of Physicians and Surgeons, removed early in May to French Lick, Ind., where he has accepted a position as physician in charge at the French Lick Springs Hotel and Sanatorium.

We presume it is no exaggeration to say that nine-tenths of the people who visit French Lick go there because of some affection of the stomach, the intestines, liver or kidneys, or are sufferers from a disturbed metabolism, such as gout, diabetes, etc., and these are the diseases to which Dr. Kahlo has devoted his professional attention. He is a member of the American Gastro-Enterological Association, has studied these conditions with some of the masters of the profession in this country and abroad, and has taught them in his college work. He has been interested also in the subject of balneology generally and has made investigations of conditions in many of the best-known European and American spas, so that he combines many qualifications for his new work.

He will have associated with him as an assistant Dr. Clarke Rogers and a corps of graduate nurses, and will have a complete equipment for the employment of the usual hydropathic, electric and other treatments which are used as adjuvants in the management of cases at such places.

PATHOLOGIST AT THE CRAIG COLONY.—Dr. J. F. Munson, a graduate of the Literary and Medical Departments of the University of Michigan, at Ann Arbor, and who has been acting as assistant to Dr. Victor C. Vaughan during the past two years, has been appointed resident pathologist at the Craig Colony for Epileptics, at Sonyea, N. Y.

THE CINCINNATI SANITARIUM.—The thirty-second annual report of the medical director of this well-known private hospital shows a gratifying increase in the year's work, the "daily average" of inmates having been the highest on record; namely, 91.

The total number of patients treated during the year (1905) was 276.

The percentage of recoveries, to admissions, was 42.16. Full statistical tables, showing the classification of diseases, which are chiefly mental; the movement of population, the ages, nativity, occupation, etc., of patients are given.

Among other evidences of progressive administration are a complete revision of the classification of patients admitted for the year 1905, which tends to harmonize this feature with the existing state of scientific psychiatry.

A new clinical laboratory has been fitted up, with appliances for blood work, etc., adjoining which is a new examination and operation room, with modern electric outfit.

Mr. H. P. Collins has been elected secretary and a member of the Board of Directors, to succeed his father, Captain Val. P. Collins, deceased.

The medical staff remains unchanged.

GOVERNMENT HOSPITAL FOR THE INSANE, WASHINGTON, D. C.—The selection of Dr. Charles H. Clark to occupy the post of clinical director at this hospital, in effect April 1, this year, simultaneously creates and fills a position in the hospital service which Dr. William A. White, the superintendent, has had under consideration since 1904. Dr. Clark has been a member of the medical staff of the government hospital since 1899, and has more recently filled the position of second assistant physician. Closer

organic connection of the different medical services, with general supervision of all medical work, of the hydrotherapeutic departments, the operating rooms and training schools; the medium through which will be made all transfers of patients from one service to another, the making of special clinical studies and an effort to keep abreast of the medical literature of the times, with a view of having adopted any line of treatment that may be beneficial, indicate the scope of this officer's duties.

Other promotions made April 1 in the medical service are: Dr. George H. Schwinn from junior assistant physician to assistant physician.

Dr. Arthur C. Fitch from medical interne to junior assistant physician.

The appointment of a female assistant in the work being done in the laboratory having been determined upon, Miss Grace A. Lane has been promoted to this position from the ward service.

The work of the woman physician, Dr. Mary O'Malley, has fully justified her appointment, which took place in September last. Her presence has been felt in the daily inspections of the female section of the institution, as likewise in the treatment of the ills of the female employees and the female patients.

The hydrotherapeutic outfits, now three in number, are in daily operation, between sixty and seventy patients being treated each day.

A number of operations have been performed in the hospital operating room. Although not numerous, they have been generally of such a character as to hardly have been justifiable except in a thoroughly equipped and modern operating room.

The piazzas on the second floor of Oaks A Building have been enclosed in glass and a ward made having a southern exposure for white tuberculous females.

Dix 3 Building has been equipped for the use of colored tuberculous males.

The Retreat Building is in process of renovation, to be later occupied by colored men, who will vacate the annex building.

The fire engine house has been fitted up and quarters have been opened upstairs for sleeping apartments for members of the engineering force, thus insuring some one on duty in this building throughout the night.

Contracts have been made for furnishing considerable quantities of fire hose and fire extinguishers for the hospital. Plans are being prepared for a somewhat elaborate installation of fire doors throughout the high buildings of the old construction.

In addition to these precautions a special engineer has been appointed who has complete charge of the fire apparatus and of the appurtenances pertaining to fire protection.

The installation of the new machinery with which the two additional wings built to the laundry have been equipped, has been completed.

A coal trestle is under construction adjoining the railroad track for use in handling hard coal. Incidentally, it may be mentioned the hospital has been receiving coal in order to be well supplied in any serious emergency that may arise, so that at this time about 6,000 tons are on the grounds.

An additional reservoir is being built at the pumping station.

Perhaps the greatest change wrought in the methods at this hospital in the past six months has been in conjunction with the installation of a more accurate business system throughout the various departments. This has been accomplished by the employment of an expert accountant, the working out of a very complete plan of auditing, cost accounting, etc., involving changes in store house methods, the issuance of goods, requisitions for supplies and the designation of a matron and chef to carefully inspect and note details in these regards.

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Original Articles

THE PUBLIC OBLIGATIONS OF THE NEUROLOGIST.¹

BY HENRY R. STEDMAN, M.D.,
OF BOSTON, MASS.

Fellow Members of the American Neurological Association:

I need not assure you that my election to this important position has been a welcome surprise and an honor which I most highly appreciate. I can only interpret your selection of me for President of this honorable and influential organization as an indication of a desire on your part to recognize by the choice of an alienist for the position the important place that psychiatry has come to hold and the widening field it covers in the domain of neurology.

It is with not a little hesitation that I venture to address your body on such a subject, although it numbers so many considerate friends gained largely through the cordial intercourse and common interest engendered by many meetings, for the alienist especially the hospital variety, still looks upon the neurologist as more or less his critic, friendly to be sure and not wholly infallible, but still his critic with that true, inexorable, scientific spirit of unrest whenever and wherever medical endeavor may seem to be lacking or misdirected.

This being so, I fear that a sermon from me on the neurologist's neglect of public duties pertaining to the nervous and insane may savor of the *quid pro quo* and seem to be an ungracious return for the honor you have done me. I feel sure, however, that you will take my words in the spirit which actuates them,

¹The Presidential address before the American Neurological Association delivered June 4, 1906.

and comfort myself with the knowledge that even the records of this association show that free criticism and discussion and occasionally warm controversy born of a determination to find the kernel of truth in every question, are the breath of its nostrils, and that nothing is unwelcome that is sound and practical doctrine. It is what your verdict on what I have to say will be on that score, that daunts me.

In looking through the programmes of the sessions of this association since its foundation, it is surprising to find that with the exception of those to be read at this meeting, scarcely two papers can be said to relate to the public questions which ought to concern the neurologist. The situation is the same though to a somewhat less extent with the literature of neurology proper in this country generally where there is a noticeable scarcity of subjects of importance as regards nervous and mental disease in relation to public health. We are quite alone in this respect. Every other important department of medicine is alive to the investigation and remedy of the public health conditions coming within its province. Glance at the titles of the medical monographs of the past two years and you will find: In pediatrics: *The Best Means of Combating Infant Mortality*; in obstetrics: *A Consideration of the Midwifery Act*; in orthopedic surgery: *The Duty of the State in the Care of Crippled Children*; in laryngology, ophthalmology and otology: *Defects of the Eye, Ear and Throat in School Children, Trachoma and Immigration—Our Detention Hospitals*; in dermatology: *The Regulation of Prostitution, etc., etc.*, while the tuberculosis crusade, by exhibits and lectures, is the crowning achievement in the encouragement of public prophylaxis.

I therefore offer for your serious thought a number of matters relating to the nervous and mental health and safety of the community in which the people at large need the advice and direction that an influential body of men like this is especially fitted to give, and a few which call for our active effort as well. But before going further afield let us turn our attention to a work which belongs to the neurologist and to no other to engage in, as it lies solely in his domain and at his very door. I refer to the establishment of charitable sanatoria for the cure or relief of sufferers of nervous diseases who are poor or of moderate means. The deplorable situation in which sufferers of this class from purely nervous diseases find themselves must surely appeal

to us all, but with the exception of one small establishment to which I shall allude later there is no sanitarium in this country so far as can be ascertained by a careful inquiry of the leading members of the association living in the larger cities, in which poor or indigent nervous cases in any number can have the exclusive care and prolonged treatment that their malady demands. This great need has long been the subject of complaint among neurologists. Here again, in this lack of means for thorough hospital care and treatment of public cases coming in its special line of work, neurology is sadly conspicuous among the departments of medicine generally.

To be sure, there are public dispensaries, polyclinics, and even wards of hospitals that are devoted to the treatment of such patients. But they are very far from being adequate. The chronic nature of nervous malady makes the medical relief obtainable through the short stay, and routine prescription, the advice there provided, of slight and evanescent benefit in many cases. The prime requisite for their improvement is, as we all know, removal of the patient from disturbing influence and environment—from the emotional conditions bred by anxiety and misery in the struggle for their daily bread. But even this is of little avail unless time is given for rest and repair. That the few days or weeks that answer for the relief of other diseases are of little avail in this class of cases and that disease which has been long in coming on will be slow to leave, have long been the axioms with which we confront the nervous invalid who is in better circumstances. A certain number of these unfortunates are sent after a vain search for better quarters and refusal of admittance on all sides by other institutions, to homes for incurables or convalescents where they may perhaps remain a little longer but where it is impossible for them to obtain what they most need—the medical advice of physicians, both visiting and resident, who understand such special morbid states, and know how to combat and either remove or relieve them. Hospitals are not equipped or adapted for their care, and interest in their special treatment is lacking. They are, therefore, received grudgingly and discharged prematurely. There are also wards exclusively for nervous cases in a few general hospitals, but except for the opportunities they afford for clinical teaching they are little better and for the same reasons. What such patients need are

separate public institutions or sanitarium, specially constructed and equipped, where they can have the intelligent technical care that their disease necessitates and treatment for the weeks and months that such cases require before they can really improve. For want of such provision these unfortunates who are often misjudged by the family and friends "go" as Laehr forcibly puts it, "from doctor to doctor, polyclinic to polyclinic, healer to healer, in a vain search for what they need." The growing number of private sanitarium for the more affluent nervous patients shows in itself that this is recognized as the only way in which their proper care can be fully attained. They are a boon to the rich, but are for them alone.

The first institution of the kind in which the poor in any number are treated was founded in this country in Boston, Mass., in 1873, by the will of Seth Adams (himself a sufferer from neurasthenia or mild melancholia), on his own initiative and called the "Adams Nervine," an unfortunate designation devised by the testator. It now accommodates 47 patients. Last year 174 were under treatment, of whom 62 were free patients. Among others it has been under the charge of two members of this association. It is doing beneficent, helpful and progressive work, and all kinds of nervous diseases are there treated except epilepsy. Insane cases are expressly debarred by the terms of the will. All the facilities for the comfortable care and advanced treatment of its inmates are provided, including hydrotherapy, treatment by electric and high frequency currents, gymnastics and workrooms. The demand for admission, however, is far in excess of the accommodations, and the relief thus afforded the mass of poorer nervous patients of the city is but a drop in the bucket of their needs.

During the last ten or fifteen years the subject of such special sanitarium has also been agitated in Germany, and through reprints most kindly provided by Dr. Adolf Meyer of New York, and Dr. Max Laehr of Berlin, I have been able to learn something of the movement there. It is an interesting object-lesson on what can be accomplished in our line of work by the concerted action of neurologists.

Benda introduced the idea there but his brochure on Public Institutions for Nervous Patients attracted little attention. In 1891 Krafft-Ebing in a public report urged the erection of sani-

taria for nervous invalids of the middle class by private charitable bodies or the Government. Moebius, in 1894, and 1896, gave great impetus to the measure by his writings on the subject and his ideas were indorsed and urged by men like Erb, Forel, Ganser, Kraepelin, Lichtheim, Paltz, and Strümpell; Jolly, Eulenberg, Smith, Fürstner and Laehr, also wrote in hearty agreement. In 1897, but a year or two after organized agitation had been begun by these neurologists the first establishment of the sort was financed, built and, in 1899, in operation. The sixth report of this institution, which is called Haus Schönow, for the year 1904, shows a total of 72 patients in the sanitarium, and 667 treated there during the year. One hundred and twenty-three received treatment in its out-patient department. The majority of the patients paid or were paid for by societies at a rate varying between five and six dollars a week. All were working people receiving small wages. Since this sanitarium was established, a number have sprung up elsewhere in Germany and plans for others are on foot. Does not our knowledge of this great need make it our duty to help to meet it? Should we not inform larger circles of the spread of nervous disorders, of the comparative uselessness of the present modes of treatment in most cases, and the loss to the family and society of the working power of these patients?

The class of cases suitable for sanitarium treatment embraces nearly all the forms of nervous disease except epilepsy, for which special institutions are now being rapidly provided in the different States, and the work of our members, notably Bullard and Peterson in this direction is the one bright spot, the single achievement of our association in the way of public care and relief of nervous patients. Besides neurasthenia or psychasthenia, hysteria, hypochondria and mild melancholia, migraine, chorea, paralysis agitans, tic, etc., would be found to profit much by an occasional stay in a sanitarium of this kind. Others are the sequelæ of apoplexy, cerebral paralysis in children, early dementia paralytica of the mild form, and tabes in the early stages, myelitis, infantile paralysis, muscle atrophies, joint diseases, etc.

There are, to be sure, many appeals and plans afoot for charitable purposes and the process of awakening the attention and interest necessary to lay the foundation of such work would be a long and difficult one in spite of the general knowledge of the

alarming increase of nervous disorders, but we have not yet even made the endeavor, and it might well happen that such a charity would strongly appeal to the very class in which the effects of nervous overstrain are particularly prevalent, the hustling, never resting business man whose prosperity has been bought at the expense, perhaps, of his nervous health.

But public conditions of health pertaining to neurology proper are by no means the only matters calling for our attention and effort, for the mental element has come so well to the front in the pathology, symptomatology, and treatment of "nervous" diseases that we must all be psychiatrists as well. I do not think we fully appreciate the advance and ever-increasing importance of this branch of neurology. We all recognize it in a general way, but it is only when we pass in review the various reasons and facts which have brought about this situation that its impressiveness comes home to us.

The number of neuroses are unquestionably diminishing with the progress of pathological anatomy and psychiatry. Dubois, a recent authority of weight, concludes that the term "neurosis" is useless except as a provisional classification, and ought to be discarded from medical nomenclature. He does not hesitate to place the neuro-psychoses of every form alongside the insanities under the name of psychoses. In fact the entire class of the so-called psycho-neuroses, itself a cumbersome and questionable designation for cases of neurasthenia, hysteria, hystero-neurasthenia and for certain deviates, degenerates, unbalanced people not actually insane, simple melancholiacs, and hypochondriacs which form so large a part of the clientèle of the neurologist, are practically mental diseases. Dana, has with convincing clearness, ushered neurasthenia into the limbo of overworked and inadequate terms. It is now to a large extent being replaced by psychasthenia and phrenasthenia, while its sister neurosis is now looked upon as simply the expression of a defective and abnormal psychical personality of a special kind for which the term "hysteria" is more of a misnomer than ever.

There is a tendency also to narrow the limits of epilepsy as a true neurosis, and its purely mental aspects as manifested in psychic equivalents, the psycholeptic conditions of Janet, certain dream states, automatism and dual or multiple personality, the relations of true moral insanity and epilepsy, the epileptic tem-

perament, etc., are the features of that disease which have increasingly interested investigators in the last ten or fifteen years.

With the treatment of the neuroses it is the same. It was to be expected that with the recognition of their essential psychical nature would come a revolution in treatment and accordingly moral and physical measures for their relief have naturally come to the front. Of our fellow-members, Prince, in 1898, struck the keynote of this reform, long foreshadowed by the isolation treatment of Mitchell, in his advocacy of the Educational Treatment of Neurasthenia and Certain Hysterical States and the teachings of Collins and Dewey have since but by different channels taken the same general course. We are also coming to regard the occupation-treatment of neurasthenia advocated by Putnam and effectively applied by Hall as one of the most prominent factors in the improvement or cure of many cases. Dubois' masterly work on the Moral Treatment of the Psycho-Neuroses has set the seal of foreign authority on psychotherapy as the accepted means for their relief. In epilepsy also the drug treatment has assumed a far less important role, and the removal of the patient from home and its harmful and humiliating surroundings and providing for him mental rest, relief and special medical supervision in retreats and colonies for the purpose is in the same line of mental and moral treatment.

Here we see adopted to meet these milder forms of mental disease the identical and cardinal resources that have most availed in the treatment of insanity since the days of Pinel, viz., moral and psychical treatment.

In the field of jurisprudence there is the same tendency, as the neurologist of prominence is called as an expert in insanity in medico-legal cases to a far greater extent to-day than ever before and is thus obliged to pass judgment on some of the most intricate problems in psychiatry.

Thus, evidences have accumulated on every hand to show that the gap between the neurologist and alienist, as to the nature of their work, which is and always has been a largely artificial one is fast closing up, and it should be equally plain that this increased scope of legitimate duties brings with it increased responsibility for the neurologist as regards the insane. Their work being a common one, should he not co-operate with the

hospital alienist as far as lies in his power and supplement his results?

We do not sufficiently realize that there is a department, so to speak, of practical psychiatry, which is as yet undeveloped. It comprises the outside, non-hospital cases, some of them insane, others of defective, breaking-down or hopelessly weakened mind and others on the borderland of vice, crime and mental unsoundness. Their needs are distinct in great measure from those of hospital patients with the developed disease, for whom sequestration in the hospital is recognized as the only practicable and humane provision. In meeting the problems that arise in dealing with this class in a just, humane, economic and practical manner the neurologist should find a great opportunity for public work. Unlike the hospital alienist he lives and works out in the world, so to speak. He is more in touch with public and professional opinion in such matters. The hospital physician for the insane lives, on the contrary, a rather sequestered life and it is impossible for him to do more than direct the treatment, care and supervision of the mass of the insane under his charge, and devote himself to the clinical and pathological work of his hospital. By the nature of his life and duties, additional public work of an active kind, outside of the hospital, is practically denied him. His assistance must therefore be largely limited to advice and suggestion, and how invaluable such counsel must be in all measures of extra-asylum public work for the insane is shown in the success of the multiplicity of methods which are now in operation for meeting the various needs of the different classes of such patients, which have been devised solely by hospital physicians to the insane. Therefore, co-operation between the neurologist without and the alienist within these institutions is greatly to be desired. It should also be borne in mind that through the consideration of public questions of this kind hospital physicians would acquire new incentives for work and force a public recognition of their valuable services to science and the State, which is now in too many cases far below their deserts.

The only hope that is in sight for checking the increase of insanity lies in its prophylaxis, and the neurologist and the family physician have exceptional opportunities for observation and study of its initial stages, at which time alone it is possible to avert or

defer the attack. In fact, their practical experience of the disease is largely confined to its manifestations in the homes of their patients. It is through the neurologist then that public knowledge should be spread of such indications of its approach as his observation and study show to be uniform and reliable and the means for meeting them in order to ward off an attack or at least to protect the individual and the community. It is for him to urge with all the help that can be given by the alienist, the adoption of public measures for the early treatment of the disease by the separate care of such patients among the poorer class either in wards or pavilions of general hospitals, or in special psychopathic hospitals as his study of their respective advantages may dictate.

Another and more promising field for public preventive work lies in the temporary supervision, protection and relief by means of charitable after-care associations, of poor patients who are discharged from hospitals for the insane as recovered or convalescent. In this way alone can we hope to prevent relapse or prolong the intervals of sanity between attacks that are inevitable. This association lent a patient ear to my advocacy of this measure eight years ago and I will not repeat the cogent reasons why this should be a practicable, tangible method of partial prophylaxis against recurrent insanity. I had begun to fear that the seed had fallen on barren ground when I learned of the very recent measures that have been proposed and largely through the indefatigable zeal of Miss Schuyler, actually put in operation, for the practical trial of after-care in New York under the auspices of the State Charities Aid Association with the cöoperation of the State Commission in Lunacy. Organized work has since been undertaken, the nature, extent and results of which I have induced Dr. Meyer, who has been among the foremost in urging its adoption there, to tell us to-day. Here, too, I am inclined to think, that the neurologist could do most effective work as he is more likely to be in close touch with outside charities and influence than the hospital physician, and therefore better situated for furthering the home interests and employment of the discharged insane patient and thus supplementing and completing the work done in the hospital.

It goes without saying that the root of prophylaxis of mental and nervous disease lies in proper mental and moral hygiene for

the young, and the physician as well as the educator and sociologist is properly looked to for technical advice by the intelligent portion of the community which needs to have its mind set at rest on various questions regarding their education. Whether overwork in the schools is an important factor in causing nervous conditions, retarded mental development or brain exhaustion, or is greatly over-estimated as such is still an unsettled question.

A live problem also is how to secure for the backward child adequate education in the public schools through separate courses of instruction suited to his capacity in the place of subjecting him to the vain struggle of keeping up with the brighter pupils, and, perhaps, acting at the same time as a clog to their progress. Here concerted effort in which we should certainly have a part is already taking shape.

The removal of the feeble-minded from hospitals for the insane and from poorhouses to the advantages of separate colony care is another and coming reform calling for our cöoperation.

The spasmodic and all but futile efforts that have been made to raise medical expert testimony to a higher plane of efficiency and dignity have been largely the work of alienists, and recently occasional cases that might otherwise have been protracted and bitter legal contests have been brought to a speedy and just conclusion either by a conference of the medical experts on both sides in the course of the trial, or an agreement between counsel for prosecution and defense to abide by the decision of a mutually chosen body of experts. Here the prominent neurologist—a power in his community—may by active cöoperation with the alienist do much along these lines to advance the good repute of the profession as regards medico-legal testimony and make less frequent the plea of insanity as a defence for crime.

A systematic inspection also, by competent experts would not fail to reveal the fact that many insane persons are to-day confined in prisons through the lack or inadequacy of precautions for ascertaining their true mental condition before commitment or after their incarceration. This condition of things has lately been ably exposed in France in the writings of Pactet and Colin, and a superficial inquiry in Massachusetts shows that the same evil prevails there. There is little room for doubt, also, that the situation is the same in every State to a greater or less extent.

Certainly justice and humanity call for aroused public sentiment and action looking to the correction of this evil, in which we should have a hand.

This array of public measures in which we might profitably engage, although a formidable one, is only a part of what there is to be done, but persistent advocacy and work directed to but a single one of them could hardly fail to be productive of much benefit to the community. By thus supplementing his valuable contributions to the more purely scientific side of neurology with practical effort in public medical work we should go far toward rounding out to the full the proper activities and usefulness of the neurologist.

Discouragement and pessimism regarding the present outlook for neurology has begun to appear in authoritative quarters, over the slow advance made in our science of late years. I doubt if this feeling is general with us, and that it has made no impression on the zeal of our workers there can be no better proof than the admirable programme of scientific communications before us, but whether this be so or not there is reason, I venture to think, for hope that the fertile field of work that I have attempted to outline may serve to arouse any waning enthusiasm among us, supply the incentive supposed to be lacking, and silence the charge that the neurology of to-day is living on its past achievements.

CARCINOMA OF THE NERVOUS SYSTEM, WITH THE REPORT
OF ELEVEN CASES.*

BY WILLIAM G. SPILLER, M.D.,
OF PHILADELPHIA.

PROFESSOR OF NEUROPATHOLOGY AND ASSOCIATE PROFESSOR OF NEUROLOGY IN
THE UNIVERSITY OF PENNSYLVANIA,

AND

T. H. WEISENBURG, M. D.,
OF PHILADELPHIA.

INSTRUCTOR OF NEUROLOGY AND OF NEUROPATHOLOGY IN THE UNIVERSITY OF
PENNSYLVANIA.

*(From the Department of Neurology and the Laboratory of
Neuropathology of the University of Pennsylvania; and from
the Philadelphia General Hospital.)*

We have had the opportunity of studying eleven cases of carcinoma implicating the nervous system, eight of these were with necropsy. From a study of these cases and of others in the literature we have made the following classification:

First—Cases in which metastasis to the central nervous system occurs from a primary lesion elsewhere in the body.

Second—Those in which the alterations in the substance of the spinal cord and brain are not distinctly carcinomatous, but are such as may be caused by pressure, etc.

Third—Those in which the peripheral nerves are diseased either with or without involvement of the brain and cord.

Fourth—Those in which no macroscopic lesions are found, and possibly in some, no microscopic lesions, and the symptoms are supposedly toxic.

Metastasis in the central nervous system secondary to carcinoma elsewhere in the body may assume many forms. It may occur as a multiple carcinomatosis, which may or may not be a part of a general carcinomatous process elsewhere. There may be only a few cancer nodules within the central nervous system, or the process may involve the brain or cord and the meninges extensively, or the meninges alone. The meningeal infiltration may be either diffuse, as carcinomatous meningitis, like the sar-

*Read at the meeting of the American Neurological Association June 1, 2 and 3, 1905.

comatous meningitis, or may be in the form of multiple small tumors.

Metastasis may occur anywhere in the brain. It is probable that cancer nodules occasionally are overlooked, either because of their resemblance to the surrounding brain tissue, or because of their minute size.

Metastasis to the substance of the spinal cord is extremely rare and is nearly always from the periphery of the cord. Metastasis in the vertebræ is more common.

In the second classification, in which alterations in the spinal cord or brain occur, which are not carcinomatous, the changes may be in the form of a diffuse sclerosis, or an acute inflammatory process. Occasionally in association with degenerative changes in the cord, there may be disease of the spinal roots and peripheral nerves.

In the third classification, viz., cases in which the peripheral nerves are diseased either with or without involvement of the brain and cord, the alterations in the peripheral nerves and muscles may be mild or severe. Raymond¹ has recently recorded a case in which the symptoms of multiple neuritis were present, but there was no cancerous invasion of the nerve trunks. The intramuscular nerve ramifications were diseased, and innumerable cancerous masses were found in the muscles; the condition was an acute miliary carcinomatosis, especially of the muscles.

In the fourth classification, in which the symptoms seem to be of toxic origin, may be included all those cases in which no gross pathological changes are found. The microscopic examination, however, may show alterations in the nerve cells in different parts of the brain and cord, sometimes a marked congestion of the blood vessels and degenerative changes in some of the cranial nerves. As toxic conditions, may be included the following: Hemiplegia, with or without aphasia, aphasia alone, monoplegia, convulsions, either general or Jacksonian in type; cranial nerve paralysis and bulbar phenomena. The psychoses which sometimes complicate carcinoma may also be placed here, although some authors believe that psychoses do not occur unless there be an intracranial metastasis.

It is noteworthy that in the majority of instances the symptoms are not so pronounced as might be expected from the pathological findings. This is either because many of the lesions pro-

duce no alteration of the surrounding tissue, or else the lesions, though apparently intense, are not sufficiently so to produce symptoms.

It will be impossible to consider in this paper the large amount of literature on the subject of carcinoma, and only the more important contributions will be referred to. It will be our purpose to dilate upon the classifications made, using such literature as is necessary and drawing our conclusions also from the cases we here record. It must of course be understood that the classification adopted is only relative, and that one case may have symptoms belonging to each division made.

Metastasis to the osseous and connective tissue coverings of the spinal cord occurs most often in sarcoma, and next in frequency in carcinoma. Schlesinger² in his monograph on tumors of the spinal cord and of the vertebræ, published in 1898, states that metastasis occurred to these coverings in 2.4% of the cases of carcinoma elsewhere in the body and in 8.8% of sarcoma elsewhere. His observations were drawn from 13,300 necropsies of all kinds. In another series of necropsy records of 35,000 cases carcinoma metastasis to the brain occurred as follows: cerebrum, 16; cerebellum, 8; medulla oblongata, 5; bones of the skull, 41; dura, 17; pia, 2; in all, 89 times. The conclusion can be drawn that metastasis of carcinoma to the nervous system occurs in the following order of frequency; vertebræ, bones of the skull, brain, and very rarely into the spinal cord.

In 1898 Buchholz³ collected 66 cases of cancer of the brain, exclusive of tumors of the hypophysis and of the bones of the skull. Of these 41 were said to be secondary, 5 primary, and the remainder were more or less doubtful. Two of the primary growths originated in the epithelium of the fourth ventricle (Wunschheim⁴) or the aqueduct of Sylvius (Coats⁵). The three other cases are regarded by Buchholz as questionable. Besides these cases which are quoted by Buchholz, Ziegler is said to have recorded a papillomatous cancerous growth of the choroid plexus and Cornil and Ranvier a similar growth of the third ventricle. Another similar case of Spaet is often quoted in the literature, but we have been unable to obtain the original paper.

Metastasis occurs more often from a primary growth situated in the mammary gland, lung or pleura, in the order mentioned.

It also occurs secondary to cancer of the stomach, pancreas, ovaries, testicles, uterus and rectum.

Metastasis to the nervous system may occur:

1. Into the vertebræ.
2. Into the bones of the skull.
3. Into the substance of the brain, cord and meninges.
4. Into the brain alone.
5. Into the substance of the brain and cord.
6. Into the meninges alone.
7. Into the spinal cord alone.

Secondary carcinoma of the brain is often multiple, and may be part of a general carcinomatosis elsewhere, as in Case IV. of Gallavardin and Varay⁶ in which from 150 to 250 cancer nodules were found in the brain, and others were in the cord. Metastasis may involve almost any portion of the brain, but the central convolutions seem to be frequently involved as in the cases of Blum⁷ and Gallavardin and Varay⁶ (Case I.).

Next in frequency are perhaps the cerebellar lobes as in the cases of Saenger⁸ and Gallavardin and Varay⁶ (Case II.). The temporal lobes are also sometimes involved, as in the case of Kufs⁹ in which there was also a cancer of the pons and in Case II. of Gallavardin and Varay⁶. In Case I. of our series, a secondary growth of the hypophysis was found, as in the recent case of Götzl and Erdheim¹⁰.

The cancer nodules may be as large as a hazel nut or even larger, or may be of microscopic size. When the nodules are small many may be overlooked unless a thorough microscopic examination is made. In multiple carcinomatosis of the nervous system, as in the cases of Buchholz³, Siefert¹¹ and others, the cancer nodules are situated chiefly near the cortex, although they may be numerous in the white matter also. Sometimes numerous small cancer nodules may become confluent forming one large mass. The inner portion of the brain may become involved because of the extension of the process by means of the arteries.

Except in the instances in which there is a general carcinomatous process, the spinal cord is rarely involved. Metastasis to the spinal cord is so extremely rare that we have been unable to find a single instance of uncomplicated cancerous metastasis to the substance of the spinal cord, except perhaps in the case of Kolisko, which Schlesinger² (p. 82) quotes.

Metastasis into the spinal cord occurs occasionally in conjunction with vertebral carcinomatosis, as in the first case with necropsy recorded by Ballet and Laignel-Lavastine¹², in which a cancerous embolus of a dural artery caused a secondary growth. It is not infrequent to find a diffuse infiltration of cancer cells in the spinal cord in conjunction with meningeal carcinomatosis. Schlesinger also mentions a case of Ewald's in which there was an isolated cancer nodule in the cauda equina. A similar instance is recorded by Scanzoni¹³. In this case, however, there was in addition carcinoma of the vertebrae and multiple carcinomatosis of the brain and cord.

Secondary carcinoma may not only involve the substance of the brain and cord, but also the meninges. In an able paper Siefert¹¹, in 1903, called attention to this subject and recorded four such cases, besides reviewing the literature. In nearly all of these cases there is dissemination of cancer nodules throughout the brain, and rarely in the cord, invasion of the pia with rapid extension of the cancer cells within the pericerebral and perispinal spaces and though not constant, secondary infiltration of the meninges over the brain, spinal cord and spinal roots.

The extent of the meningeal infiltration varies of course, and depends upon the number and size of the cancerous tumors. Siefert believed that at least in those cases in which the tumors are peripheral and reach the pia, meningeal infiltration is possible. This, however, does not always occur, for cases are recorded in which meningeal infiltration was absent although the tumor mass invaded the cortex and pia.

The meningeal infiltration, according to Siefert, usually begins in the cerebral meninges and rarely in the spinal. Again, spinal infiltration may be entirely absent. The infiltration may be either in the form of a continuous mass or as a flat tumor, or may be in separate masses. The former is the more common. In general it may be said that carcinomatous meningitis resembles greatly sarcomatous meningitis, both in its pathological and clinical peculiarities. Among the authors who have recorded such cases, in addition to Siefert, are Lilienfeld and Bender¹⁴, and Scanzoni¹³.

Meningeal infiltration may be present alone, without involvement of the nervous tissues. Such are the cases of Saenger¹⁵, in which there was a pial infiltration at the base of the brain and

also in the lateral surface, and of Hellendall¹⁶, in which there was a diffuse carcinomatous infiltration of the cerebral dura.

As is well known, vertebral carcinomatosis is a frequent form of cancerous involvement. We will not discuss this subject extensively, as we¹⁷ have written before about vertebral carcinomatosis, and will only consider the unusual complications. As a rule the cancer cells invade the space between the bone and the dura mater, and exceptionally, the cancerous cells surround the entire dura and the spinal roots. Very exceptionally, the cancer cells penetrate into the dura and more rarely into the spinal cord itself. Such are the cases of Ballet and of Laignel-Lavastine¹². Taylor and Waterman¹⁸ recorded an exceptional case in which the cancer cells invaded the spinal membranes and were entirely within the dura. The infiltration surrounded the whole spinal cord and infiltrated both the anterior and posterior spinal roots, and in the postero-lateral portion invaded the spinal cord.

The rapid involvement of the spinal cord which is sometimes seen in the course of carcinomatosis has always excited great interest. An acute myelitis may occur without the slightest pressure, and is generally explained as a result of intoxication.

Although the primary growth may be a scirrhus cancer, metastatic tumors of the nervous system generally contain more cancer cells and less stroma. On account of growth of vascular connective tissue the tumor may appear papillomatous. The secondary cancer masses found in the ventricles can always be differentiated from the primary growths by the scarcity of connective tissue in the former (Kufs). This was well shown in the case of Kufs.

Within the cancer nodules hemorrhages and areas of softening are sometimes observed. The nervous structures around the cancer growth are only slightly altered, there being perhaps a little glia cell increase, as the nervous tissues are pushed aside and destroyed.

It has perhaps been insufficiently recognized that carcinoma of any organ of the body, but especially of the nervous system, may cause degenerative changes in the nerve cells of the brain and spinal cord at parts remote from the tumor. Whether this is the result of an auto-intoxication, or of a toxin of cancer, or of cachexia, or perhaps of all of these causes, is a difficult question to answer. We have found in our cases in which metastasis occurred

either to the brain or to the vertebræ, disease of the nerve cells of different parts of the brain and cord. This subject will be further discussed under toxic changes.

It may be said that the clinical diagnosis of carcinoma of the nervous system is most difficult. The principal reason for this is the multiplicity of the lesions. Most varied diagnoses have been made in cases of carcinoma: brain tumor, hysteria, and syphilis being the most common. Whenever cancer occurs in any of the viscera, subsequent nervous symptoms should cause immediate suspicion of metastasis; but the diagnosis is often difficult because the primary lesion is not detected. Even the diagnosis of the vertebral carcinomatoses may offer difficulties, for as we have here pointed out in a previous communication¹⁷, it is sometimes difficult to differentiate between multiple neuritis, spinal caries and vertebral carcinomata.

Alterations in the Nervous System Not Due to Metastasis.

The diffuse degenerations in the spinal cord which sometimes accompany cachexias are well known. Lubarsch¹⁸, for instance, examined the spinal cords of nineteen cases of cancer of different regions and found alterations in eleven. These consisted mostly of a diffuse degeneration of the posterior and lateral columns, such as are found in anemias and other cachectic conditions. Sometimes the anterior columns may also be partially diseased. It is not uncommon to find accompanying these diffuse degenerations, disease of the spinal roots, especially the posterior, and also of the peripheral nerves.

Meyer²⁰ recorded an exceptional case in which the symptoms of primary disease of the pyramidal tracts appeared, at the same time as the symptoms of a primary cancer of the uterus.

The involvement of the spinal cord may be in the form of an acute myelitis. This may appear independently of any other involvement of the spinal cord, as in the case of Nonne, or may accompany vertebral carcinomata, independently of any compression of the cord.

Clinically the diagnosis of diffuse degeneration of the spinal cord occurring in carcinoma is not always made. This is sometimes because of mild spinal involvement, but mostly because of the preponderance of the other symptoms. It is still a question whether these lesions are the result of a toxin, or merely of a cachectic condition. The latter probably is the more potent cause.

Alterations in the Peripheral Nerves and Muscles.

The peripheral nerves may be involved in three ways. First, by direct contact with the cancer growth, as in a vertebral cancer, or as in Case I. of our series in which the oculomotor nerve was partially involved by the growth in the hypophysis. Second, there may be an acute neuritis due to the cancer toxin, or a chronic inflammation due to the cachexia. Third, the peripheral nerves may be normal, but, as in the case of Raymond¹, the finest intramuscular nerve endings may be implicated by innumerable cancerous masses in the muscles, a true carcinomatous neuro-myositis.

The symptoms may come on acutely, as in the case of Francotte²² (Case 2). In our Case III. the patient had alcoholic multiple neuritis, but in the course of a year most of the symptoms disappeared, although the reflexes remained lost. Later the symptoms of an esophageal cancer appeared, and coincident with this, the neuritic symptoms reappeared, and became gradually more acute. This case illustrates well the influence of cancer toxin on peripheral nerves. Alterations in the peripheral nerves and muscles without any symptoms are common, and are probably caused by the cachexia, as in our Case II. in which the peripheral nerves of one hand were degenerated, although there were no symptoms. Similar instances have been recorded by many authors, as Auché²³, Oppenheim and Siemerling²⁴, and others. Histologically the alterations are chiefly parenchymatous.

Besides a multiple neuritis, a neuritis of one or a number of cranial nerves or of a plexus, may occur. For instance, in our Case VII. several cranial nerves were paralyzed, while at necropsy, a degeneration of all of these nerves affected clinically was not found. Such alterations are undoubtedly toxic, and will be considered under that head. At times paralysis of a brachial plexus may occur, and this may be caused by the proximity of a cancer of the breast, the cancer poison being carried by the lymphatics.

Changes in the Nervous System Due to Carcinoma Toxin.

Some authors still dispute as to whether the rather bizarre nervous symptoms which may occur in the course of carcinoma are of toxic origin. Saenger, for instance, believes that definite organic changes cause the so-called toxic symptoms, while other authors believe that gastric intoxications are the cause. However, there is no doubt that different symptoms may appear in

a case of carcinoma in which at necropsy no macroscopical lesions are found to explain them, but by microscopic examination diffuse changes may be discovered, which are not commensurate with the clinical symptoms.

Such a disease as carcinoma exerts a powerful influence upon the various functions of the body, the intensity of which probably depends upon the nature of the growth plus the inherent resistance of the nervous system to untoward influences. In no other manner can we explain the occasional involvement of the nervous system in carcinoma of other structures.

The nerve cells in carcinoma are particularly susceptible. Thus Sirleo²⁵ in two different cases of cancer of the abdominal walls examined the nervous system by the different modern staining methods, and was able to demonstrate by the Nissl method a degeneration of the nerve cells of the cerebrum, cerebellum, spinal ganglia and especially of the cells of the anterior horns of the spinal cord. It is probable that if the nerve cells were examined in every case of carcinoma, whether the nervous structures were macroscopically involved or not, degenerative changes would often be found.

In almost all of our cases the nerve cells were more or less diseased, and curiously enough, were much more degenerated in the so-called toxic cases than in those in which the nervous structures were the seat of cancer. The extent of the involvement varies, but it may be said that the greater the toxemia, the more the cells are diseased. The alteration of the nerve cells is always diffuse, and is never limited to certain parts of the brain and cord. Thus in Cases VI. and IX. in which clinical signs were found, the degeneration of the nerve cells was not limited to the bulbar nuclei, but involved other parts. Again in Case VII. in which the clinical symptoms pointed to an involvement of different cranial nerves or their nuclei, the degeneration was not limited to these nuclei, but involved others, although symptoms of this extensive disease were not manifest. Again, nuclei of nerve cells may be normal although from the symptoms pathologic changes may be expected.

As a rule, the changes occurring in the nerve cells are not very intense and consist in a displacement of the nucleus to the periphery, and a disintegration of the chromophylic elements. The

nerve cells, however, may be intensely diseased and swollen and their chromophylic elements entirely disintegrated.

Whenever toxic symptoms occur, some of the cranial nerves are nearly always involved as in the case of Miura²⁶, Bettelheim²⁷, and in Case VII. of our series. Of the cranial nerves, those concerned with ocular movements, and the optic nerves, are most frequently involved. Microscopically the alterations consist principally in swelling of the axis cylinders, the myelin sheath not being much altered. At times the cranial nerves which show involvement clinically, may not be altered pathologically, and *vice versa*. In one of our cases, No. VII. quite a large area of swollen axis cylinders was found on either side of the aqueduct of Sylvius. This indicates that the cancer toxin causes degenerative changes not only in the nerve cells but also in the nerve fibers, whether in the cranial nerves or in the brain itself.

The blood vessels may be the seat of intense congestion as in Case VII. in which many of the small blood vessels in the cerebrum, optic thalamus, cerebral peduncles and pons were intensely congested, especially near the oculomotor nuclei. In places a round cell perivascular infiltration was found.

Clinically, the toxemia of carcinoma may produce a variety of conditions. Coma, mental apathy, psychical disturbances, hemiplegia, monoplegia, convulsions either general or Jacksonian in type, bulbar symptoms and involvement of the different cranial nerves have all been recorded. In fact it may be said that the toxic symptoms due to cancer may be as varied as the symptoms found in hysteria or syphilis.

We have already written upon bulbar symptoms occurring in carcinomata, but because of additional cases we will again consider this subject. The first case of this kind was recorded by Bruns²⁸, the second and third by us (Cases VI. and IX. ^{17, 29}, and the last by Warrington³⁰. In the case of Bruns nothing was found microscopically, while in our two cases and in the case of Warrington alterations were found in different nerve cells of the bulb, the alterations, however, were not commensurate with the symptoms. In all of these cases the symptoms were purely bulbar, and consisted in atrophy or paralysis of the tongue and palate, difficulty in talking and swallowing, and dribbling of saliva.

In two additional cases which have come under our observation the symptoms appeared directly after operative procedure, in one

after an abdominal operation and in the other after removal of a cancer of the glans penis with subsequent sloughing of the part. It seems as if the disturbance of circulation caused by the operation increased the dissemination of the toxic substance. In one case (No. XI.), besides irregular jerkings of the head and limbs, a paresis of one facial nerve and some nausea and vomiting occurred, the patient had difficulty in pronouncing words and stut-tered frequently. These symptoms lasted only a short time and improvement occurred rapidly.

In the other case (No. X.), the symptoms consisted in a loss of function in the muscles of articulation, and at times in complete aphonia. The patient tired very easily, especially in the back and head, and when examined three months after his operation, his speech was slow, monotonous but strong, hesitating but not like that of multiple sclerosis. A throat examination did not show any organic changes. There were no other symptoms.

It is rather difficult to explain why these bulbar symptoms should occur except as a result of a general toxemia, when those functions are disturbed first which are most employed.

We have already mentioned that the cranial nerves are frequently involved in cancer toxemia, and that the ocular muscles may be the seat of paralysis. Thus in the case of Miura there was bilateral optic neuritis and paresis of the oculomotor and abducens nerves; in Bettelheim's case, one third and one seventh nerve were paralyzed, while in Case VII. of our series there was complete internal and external ophthalmoplegia of one side besides a facial palsy.

Psychic symptoms are uncommon in the course of carcinoma. Elzholtz³¹, in 1898, made a résumé of the literature and collected fifteen cases of cancer with psychoses. Of these, in thirteen there was metastasis in the brain, and he concluded that in most cases, psychic symptoms occur only in metastasis. They may, however, be of toxic origin, as in Case XI., in which the patient's mind was cloudy and the meaning of remarks made to her was not understood; and in another case observed by us in which a patient with a carcinoma of the uterus, but with no metastasis to the nervous system, had periods of excitement.

The psychoses are generally of the confusional type, but occasionally the patients are maniacal or the symptoms may be those of general paresis (Elzholtz).

Case I. A woman, 52 years of age, had a cancer of the breast removed two years before she came under the observation of Dr. James Tyson and Dr. C. K. Mills, to whom we are indebted for the notes and the material of this case. She did not have recurrence in the breast, but numerous nodules, evidently cancerous, developed in different parts of the integument and in the upper part of the scalp.

Since the operation she had not been well and was treated for "nervous prostration" several times. She had dizziness, nausea, and irregular headaches, especially in the left orbit and temple. Her vision gradually became impaired, and the limbs weak. The patellar reflexes were exaggerated.

The eyes were examined by Dr. G. E. de Schweinitz, who reported as follows: "Vision, O. D., 3-30; O. S., 3-60. Pupils: right 2. mm., left, 3. mm. Wernicke's reaction sign present. There is

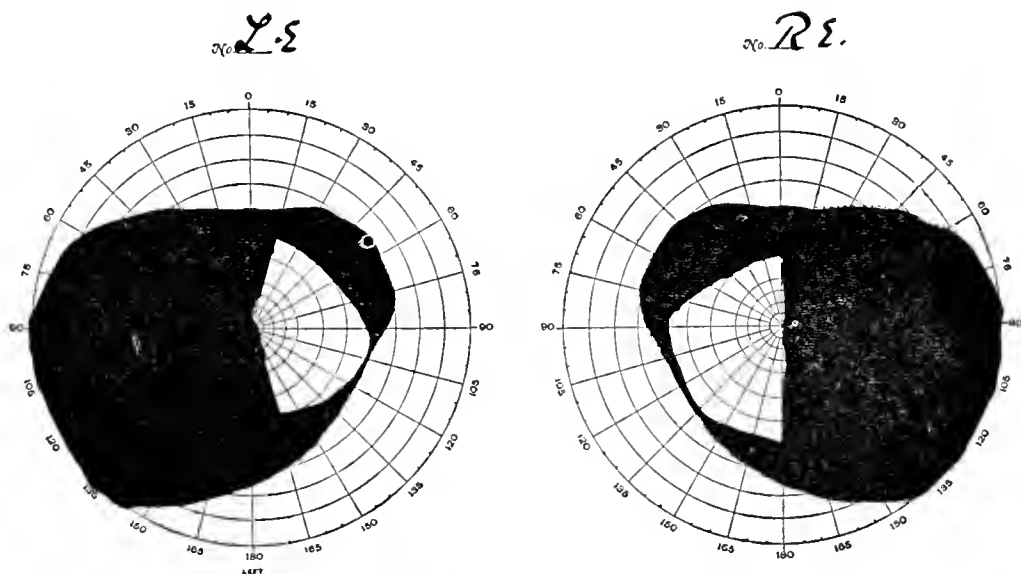


Fig. 1.—Bitemporal Hemianopsia.

palsy of the left levator and left superior rectus muscles. The ophthalmoscope shows the eye grounds to be gray, slightly blurred discs, but no neuritis nor atrophy in any advanced stage. Bitemporal hemianopsia, as shown below, was present." Dr. de Schweinitz thought that from the ophthalmoscopic standpoint a lesion so situated as to involve the posterior part of the optic chiasm and the superior division of the left oculomotor nerve would explain the symptoms.

The necropsy was performed by us. The examination showed a lump of stony hardness in the exact center of the vertex. On removing the scalp the growth was found to measure one inch laterally and one and one half inches anteroposteriorly. It extended through the calvarium and was adherent to the dura.

The cerebrospinal fluid was not increased in amount, and the

brain was not especially edematous. The dura was not adherent to the brain even at the seat of the growth described above.

The sella turcica was much enlarged, being almost one and one half inches in width from side to side, and one inch from before backward. A large tumor mass filled the sella turcica and extended around the optic chiasm and grew into it. It was more extensive on the left side than on the right, and extended as far posteriorly as the anterior part of the pons. The right optic nerve was free from all tumor tissue, the left was attached to the tumor mass.

Scattered throughout the general integument were several hard masses ranging in size from a large hen's egg to a pigeon's egg. The largest of these was within the right scapula. Several

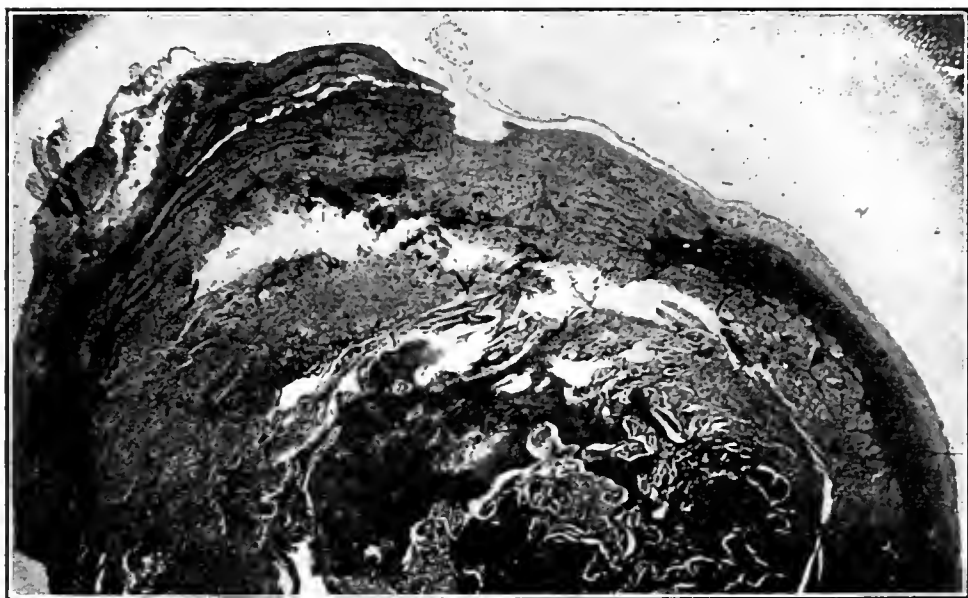


Fig. 2.—Showing Invasion of Chiasm by the Carcinoma; a Few Nerve Fibers of the Chiasm Are Seen on Each Side.

smaller nodules were found in the mid-axillary line about the junction of the eighth rib, one in the left groin, and one in the left shoulder. A large tumor mass was also found invading the summit of the uterus.

Microscopic examination: The chiasm was much invaded by the carcinoma with great destruction of tissue. The optic nerves did not appear degenerated, or if so, very slightly. A round cell infiltration was found in the pia of the medulla oblongata. A section of the left oculomotor nerve showed invasion by carcinoma cells, and the nerve was adherent to the tumor mass.

Case II. A woman of about sixty, was a patient of Dr. M. B. Dwight, and was seen by one of us with Dr. Dwight and Dr. Wm. Evans. She had had a tumor removed from the right breast twelve years ago, and a few months before she was seen in

consultation had had another operation when some tissue, probably carcinomatous, was removed. She was well until eight months before coming under observation, when she complained of pain in the back of the neck, and this region was also tender to pressure.

Examination showed the pupils to be of equal size, the reaction to light was normal. Extraocular movements were normal. There was no involvement of any of the cranial nerves. Sensations for touch and pain were normal over the face.

The patient could not move the right upper limb at the shoulder, but all of the other movements of this limb and of the left upper limb could be performed slowly. Grasp of each hand was feeble, and she had difficulty in picking up a pin. The biceps and triceps tendon reflexes were about normal.

The lower limbs were spastic, and when walking the steps were short, but she did not stagger. The patellar jerks were equally exaggerated, but there was no ankle clonus. The Babinski reflex was uncertain. Sensation was diminished in all four limbs for touch and pain, pain sensation being more diminished in the right upper and left lower limbs. There was no pain on pressure in any of the limbs.

The necropsy was performed by one of us. The carcinomatous mass involved the vertebræ and the surrounding structures from the third to the sixth cervical vertebræ inclusive, rendering the tissues soft. The spinal cord was compressed in this area: the area of softening beginning in the lowest portion of the third cervical segment and involving the fourth, fifth and upper portion of the sixth cervical segments. The carcinoma tissue invaded the dura but did not penetrate it.

Microscopical examination: There was no very distinct degeneration by the Marchi method, either in the cervical or thoracic regions of the cord, although a few black dots were found in the crossed pyramidal tracts. These black dots were not very numerous but could be regarded as a slight secondary degeneration. No degeneration was evident either in the cervical or lumbar regions by the Weigert hematoxylin, or the acid fuchsin hemalum stains. With the thionin stain, some of the cells of the anterior horns were diseased but the alterations were not very distinct. The paralysis in greater part must have been due to a compression of the cord, which was not sufficient to cause intense secondary degeneration.

In the medulla oblongata the Marchi stain showed intense degeneration of the columns of Burdach on each side. The Weigert hematoxylin and acid fuchsin hemalum stains did not show any pathological changes. The cells of the nucleus ambiguus and of the twelfth nucleus were normal.

The Betz cells of each paracentral lobule showed some alteration, the cell body being swollen and the nucleus displaced; there

was also considerable disintegration of the chromophylic elements.

A piece of muscle from one hand did not show any degeneration but a piece of nerve showed slight degeneration by the Weigert hematoxylin method.

This case was clearly one of vertebral carcinomatosis, but clinically the intense pains which usually accompany this disease were absent. The pathological findings were not exceptional except that the nerve cells of the anterior horns in the spinal cord and especially the Betz cells of the paracentral lobules were degenerated. This probably was caused by the cancer toxin, as was also the degeneration found in a peripheral nerve, of which no clinical signs had been manifest.

Case III. W. McF., was admitted to the nervous wards of the Philadelphia General Hospital, December 8, 1903. This patient was a man of sixty years and had alcoholic multiple neuritis of the ataxic form, and had in addition the psychosis frequently seen in this disease. He recovered after a long illness and about a year later the only remaining symptoms were those of lost tendon reflexes, slight steppage gait and perhaps a little tenderness on pressure over the nerve trunks of both feet. His mentality at this time was normal.

About one year after the subsidence of the symptoms of multiple neuritis he began to complain of difficulty in swallowing and regurgitated food. Gradually these symptoms increased, until he was unable to swallow anything but liquids. His strength failed, and he became cachectic. An esophageal cancer was diagnosed. Coincident with the appearance of these symptoms he began to complain of pains in his limbs and of great tenderness on pressure over his nerve trunks. These neuritic symptoms gradually grew worse, and became almost as severe as in the previous attack.

He died January 30, 1906. An esophageal cancer was found.

Microscopically, the spinal cord was normal. The nerve cells of the anterior horns were in fair condition. A piece of nerve of one hand showed very intense chronic degeneration, the nerve fibers had almost entirely disappeared. A piece of muscle from the same hand showed considerable atrophy of some of the muscle fibers, with overgrowth of the connective tissue. A piece of nerve teased in the fresh state and stained by osmic acid showed no recent degeneration.

This case illustrates the effect of carcinoma toxin upon peripheral nerves, as shown by the reappearance of the neuritic symptoms.

Case IV. Admitted to the Philadelphia General Hospital, March 13, 1906. The patient was a woman of about 40 years of age who, one year before she came under our observation had a cancer of the left breast removed. About ten months after

this she began to complain of radiating pains across the chest and back, and in her lower limbs. A month after this she suddenly lost power in her lower limbs, since which time she has been in bed. She complained of girdle sense but not of extreme pain. Examination showed the cranial nerves to be normal. Her mentality was good. The upper limbs were not involved. She was unable to move her lower limbs and these were in flexor contracture, the legs on the thighs and the thighs on the abdomen. The patellar and Achilles jerks were not obtained on either side. The Babinski response was positive on both sides. Sensations for touch and pain were lost over the lower limbs, abdomen and chest to a point about three inches above the umbilicus, except on



Fig. 3.—Intense Bedsore Occurring with Vertebral Carcinoma.

the dorsum of each foot, where occasionally a pin prick was recognized. There was incontinence of urine and feces. The diagnosis of vertebral carcinoma was made. The patient died, April 3, 1906. The necropsy showed a carcinomatous involvement of the thoracic vertebræ with a compression of the upper thoracic chord.

Case V. Beard, was admitted to the nervous wards of the Philadelphia General Hospital, December 24, 1904. He denied venereal disease. The history obtained was very unsatisfactory.

The face and upper limbs were not affected, but the lower limbs were almost completely paralyzed, although some movement was possible at each hip and each knee, and the toes were moved slightly. The patellar reflex was exaggerated on each side, but ankle clonus was not obtainable. Babinski's reflex was distinctly present on each side. Sensations for touch and pain were

preserved in the lower limbs, but tactile sensation was diminished on the soles of the feet. Retention of urine was present.

Dr. Knipe reported, January 10, 1906, that the patient had paresis of the left external rectus and of both superior recti, nystagnoid movements on extreme right lateral deviation, severe grade of optic neuritis (partially choked disc) in the right eye, with atrophied spots above following old hemorrhage, and a few fresh hemorrhages near the disc to the inner side. The disc of the left eye was markedly swollen, but not so much as that of the right eye.

There is only one record of any pain in the lower limbs and this was made July 10, 1905.

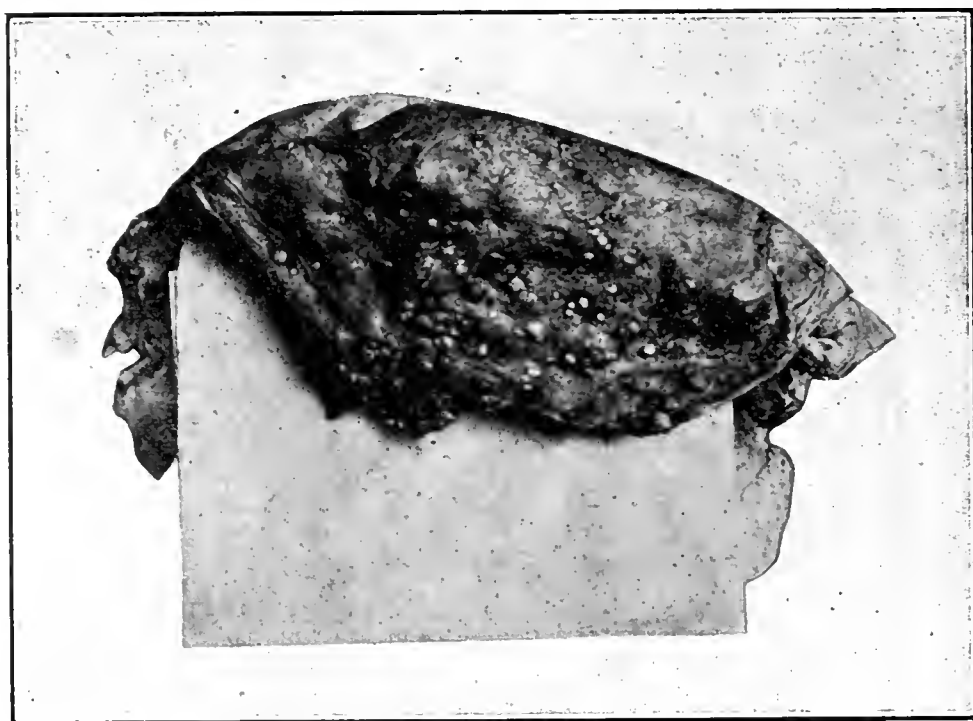


Fig. 4.—Numerous Carcinoma Nodules from the Size of a Millet Seed to that of a Pea on the Inner Surface of the Cerebral Dura.

He came again into the service of one of us in January, 1906. At that time his condition was as follows: He lay in bed with the thighs strongly flexed on the abdomen and the legs flexed on the thighs. He had slight voluntary power in flexion of each thigh, but it was very doubtful whether he had any voluntary movement of his toes. The slight upward movement of the toes which sometimes occurred was probably reflex. The lower limbs were much wasted. The patellar reflex and Achilles tendon reflex were absent on each side. The Babinski reflex was very typical on each side. Tactile and pain sensations were entirely lost in the lower limbs. He had no control of the urine or feces, and the bowels did not move without enema. He moved the

upper limbs freely but the movements were weak. These limbs were also wasted. Biceps and triceps tendon reflexes were present on each side, and about normal, considering emaciation which was general. The pupils were equal. The movements of the eyeballs were probably good, though it was impossible to get him to respond promptly. No impairment of cranial nerves was detected. The abdominal muscles were intensely rigid and the abdomen was distended. A necropsy was obtained.

The bone on the whole left side and upper portion of the skull was thickened, and measured about $\frac{3}{4}$ -inch in thickness at the mid portion. The thickening seemed to be caused by the infiltration of a tumor connected with the dura and covering internally the thickened portion of the skull. The tumor (carcinoma) invaded the posterior portion of the second, third and fourth left temporal convolutions; its upper margin began at the lower portion of the second temporal convolution and the anterior margin at the mid portion of the affected convolutions. It involved the tentorium posteriorly. The dura covering the left cerebral hemisphere was thickened and numerous nodules from the size of a millet seed to a pea were found on the inner side of the thickened dura. These were shown to be carcinomata. The spinal dura was adherent at the sixth, seventh and eighth thoracic vertebræ, and the bodies of these vertebræ were soft. Carcinomata were found in the liver, ribs and prostate gland.

The absence of all cerebral symptoms, except ocular, in this case was remarkable.

Case VI. This case has been previously reported by us, and only an abstract is given. M. R., a woman, forty-eight years old. Eight years before coming under observation had an abscess(?) of the right breast which ruptured and discharged pus. Four years afterward she began to have sharp shooting pains in her back and around her waist, and later pain in her limbs. Since three weeks after the beginning of her pains she had been confined to her bed. There was extreme atrophy in all of her limbs, more marked in the lower. The upper limbs could be but weakly moved voluntarily. No voluntary movement was possible in the lower limbs. The arm reflexes were present and exaggerated but the reflexes of the lower limbs were absent, probably on account of the extreme atrophy. Sensation was irregularly diminished. She had sharp, spontaneous pains in all of her limbs, and the slightest touch would cause extreme pain. The lower limbs were contracted in flexion. There was a bilateral atrophy of the tongue with fibrillary tremors and weakness in movement.

At the autopsy, metastatic carcinomatous growths were found in the cervical region implicating the bodies of the vertebræ and the surrounding structures, and in two places the growths had implicated the spinal canal. These growths were on the

outer surface of the dura and did not penetrate the membrane. The spinal cord was compressed.

In the microscopic examination, the carcinomatous masses found outside of the dura, did not penetrate very far into the dura, and distinct carcinomatous tissue was not seen within this membrane. The carcinomatous masses were chiefly on the posterior part of the dura. The spinal cord showed the usual changes of compression myelitis.

In this case we have the typical symptoms of a vertebral carcinomatosis. The bulbar symptoms were unusual.



Fig. 5.—Carcinoma on the Posterior Part of the Spinal Dura Not Penetrating the Dura.

Case VII. Was admitted to the Philadelphia General Hospital, September 8, 1903, in the service of Dr. H. B. Allyn, but was transferred to the service of Dr. C. H. Frazier because of fracture of the humerus. The fracture occurred while she was being lifted in bed to an upright position. The notes then made were as follows: "The patient is fifty years of age. A carcinoma of the breast was removed sixteen months before she came under observation, and she has a recurrence in the same place. She complains of pain in the back of the neck and in the hips, especially the left, at the site of operation, and in the back. Five weeks

before her admission to the hospital, coincident with the pain in the neck she began to have failure of vision. For several months she has had morning vomiting, and about a year ago she had a swelling at the carpo-metacarpal joint of the left thumb.

There is some exophthalmos of the right eye, but no ptosis. The right pupil is smaller than the left, and responds to light and in accommodation. The right external rectus is paralyzed. She says she can see better with the left eye.

There is ptosis of the left eyelid. The left pupil is larger than normal and does not react to light or in accommodation. The left pupil does not respond to pain stimulus, whereas the right pupil does. Paralysis of the left external rectus and partial paralysis of the left superior rectus exist.

There is no paralysis of the other cranial nerves, nor involvement of the special senses other than that of sight. Both hips are tender and she cannot stand without support."

Other notes made later by one of us (Dr. Spiller) were as follows: "The patient has almost complete ophthalmoplegia, internal and external, of the left eye, and distinct but not equal weakness of the left seventh nerve. She complains of headache over the frontal region, and has had dizziness and weakness of the legs. The patellar reflex is lost on each side, and there is no ankle clonus or Babinski response on either side. She has marked tenderness over the spinal column between the shoulders but no deformity of the spinal column or tumor formation." She died three weeks after her admission to the hospital.

Macroscopical examination did not show any gross changes. The microscopical examination was as follows:

Cranial nerves.—The optic nerves were perfectly normal, both by the acid fuchsin and Weigert hematoxylin stains. A cross section of the optic chiasm did not show any pathological changes.

Some of the axis cylinders of the oculomotor nerves of each side were distinctly swollen.

The left fourth nerve was normal, but some of the axis cylinders of the right fourth nerve were distinctly swollen, but not so much so as those of the third nerve.

The right sixth nerve showed intensely swollen axis cylinders by the hemalum acid fuchsin stain. The left sixth nerve was not obtained.

Some of the axis cylinders of both seventh nerves were swollen, but not nearly so much as those of the right sixth.

Medulla Oblongata.—Sections from the medulla oblongata seemed to be normal. The blood vessels were not congested.

Pons.—The blood vessels within the pons were much congested, and this congestion was more distinct in the posterior part of the pons. There was also some perivascular round cell infiltration. Quite a large area of swollen axis cylinders was found on each side of the aqueduct of Sylvius.

Cerebral Peduncles.—A similar state of congestion was found in the posterior part of the cerebral peduncles, especially around the nuclei of the oculomotor nerves.

Optic Thalamus.—Sections from this area showed intense congestion, there was also a slight perivascular infiltration around the blood vessels.

Cortex.—There was considerable congestion in sections from each frontal and each occipital lobe, but not nearly so much as in the pons and cerebral peduncles. The cerebellum was normal.

Nerve Cells.—Many of the cells of the third nerve on each side were distinctly diseased, being swollen, presenting chromophylic changes involving all parts of the cell, and the nuclei were displaced to the periphery. Many of the cells of these nuclei were normal.

The sixth nucleus on each side was very much affected, if anything more so than the oculomotor, and in a similar manner.

The seventh as well as the twelfth nucleus on each side was perfectly normal. The nucleus ambiguus of one side, the Betz cells of each paracentral lobe, and the nerve cells of each occipital and frontal lobe were in a healthy condition, but some of the cells of Purkinje showed some displacement of the nucleus.

The symptoms in this case were probably caused by the carcinoma toxin. This case illustrates well the widespread effect of such a condition, and the pathological changes found in the nerve cells, blood vessels and cranial nerves are typical.

Case VIII.—A woman about 60 years of age, was seen in consultation by one of us with Drs. L. W. Steinbach and Dr. David Riesman. Two years before this examination a carcinoma of the left breast was removed by Dr. Steinbach, and for the past fifteen months she has had pain and swelling in the left knee, and pain in the neck for about seven weeks.

There was no cachexia and intellect was clear. Vision in the right eye was good, in the left eye a cataract operation had been performed. The light reaction in the right eye was prompt, all the cranial nerves were normal.

The movements of the neck were restricted in all directions. She could move her head from side to side and backwards and forwards slightly, but the movements caused pain. Turning her in bed caused excruciating pain. There was a swelling in the spinal column in the back of the neck.

It was impossible for her to move the left upper limb at the shoulder, but she could flex the left forearm on the arm freely. The grasp of each hand was normal. Movement in the right upper limb was good. The biceps and triceps tendon reflexes were exaggerated on both sides, much more so on the right side. Sensations for pain and touch were normal everywhere.

Much numbness and pain were present in the left upper limb.

There was no voluntary movement in either lower limb, except in the toes where movement was free. The left thigh seemed smaller than the right. The patellar reflexes were exaggerated, more so on the left, as shown by the prompter contraction of the quadriceps, rather than by movements of the leg. The Achilles jerk was not distinct on either side, and the Babinski response was not obtained, the toes not moving on plantar irritation. Any movement of the lower limbs caused intense pain. There was no tenderness to pressure over the spinal column.

This patient also showed the usual symptoms of vertebral carcinomatosis. She subsequently died, but an autopsy was not permitted.

Case IX.—This case has been reported by one of us in a previous communication and only a short abstract will be given. A woman of fifty-nine years developed a cancer of the right breast thirteen years previously. Five months before her death she began to complain of difficulty in swallowing and talking. When examined a month before her death she could talk only in a whisper and could swallow fluids only with difficulty. There was no atrophy of the tongue, lips or face.

At the autopsy no macroscopic lesions were found, but microscopic examination showed an alteration in some of the nerve cells of the nuclei of the sixth, seventh, ninth and tenth cranial nerves.

This was the third case of bulbar symptoms occurring in carcinoma reported, and the first in which bulbar symptoms occurred alone. These were not due to an alteration of some of the nerve cells, but to the general intoxication.

Case X.—A man of forty-one years, with an excellent family and past history, was sent to one of us for opinion by Dr. W. M. Robertson, of Warren, Pa., with the following history: Three months before he came to Philadelphia he was seen by Dr. Robertson, the patient then having a cancer of the glans penis, following phimosis. A few days later the part was amputated and the inguinal glands removed. Several days after this he developed a cystitis and urethritis from the retention catheter, and at the same time the end of the stump sloughed. These symptoms caused a high temperature for a few days.

The condition of the patient was good during the fever, but when it left, there was loss of function of the muscles of articulation and at times complete aphonia. The mental condition was good. He also had some photophobia and double vision. After a week his voice returned somewhat but did not fully recover its former quality. Examination by one of us three months after the onset of the cancer symptoms showed the pupils to be normal in size, the reaction to light, accommodation and convergence nor-

mal. Extraocular movements were not impaired. The facial and trigeminal nerves were normal on either side. Sensations for touch and pain were normal over the face.

The upper limbs were not weak, but there was not much resisting power. There were no subjective pains. Sensations for touch, pain and temperature were normal in the forearms and hands. The biceps and triceps tendon reflexes were normal. Power in the lower limbs was normal. The patellar and Achilles jerks were normal. The Babinski sign was not obtained. Sensations for touch, pain and temperature were normal over the feet.

The voice was slow, monotonous but strong; hesitating but not like that of multiple sclerosis. The patient would tire easily, especially in the back of the head and neck. After an automobile ride he became extremely exhausted and had complete aphonia. Weakness was so great that he could not turn in bed. All voluntary muscles moved slowly.

Dr. Freeman examined the throat and reported that there was no organic disease of this part. There was some congestion of the larynx and trachea which made speaking a little difficult and caused the patient to clear his throat, but Dr. Freeman did not believe that this had any influence on his curious manner of speaking. The tissues of the larynx were relaxed and there was a marked sluggishness in the action of the laryngeal muscles. Dr. Freeman considered the difficulty in speaking as caused by mental disturbance and believed that time would bring about a full recovery.

In this patient the weakness of the muscles of articulation may have been caused by the cancer toxin, and was really part of the general weakness with which the patient suffered. It is a striking fact that these symptoms did not come on until after the removal of the growth and the appearance of sloughing of the part. This can probably be explained as in the following case, by the dissemination of the toxin by the circulation. Some of the features suggest myasthenia gravis.

A letter received from Dr. Robertson, February 12, 1906, is as follows: "Mr. E.— has done quite well. His improvement is slow but constant. He has grown fleshy. I have been a little in doubt as to whether or not there is present a certain caste of mind like that of senility. The speech is not right, but is better than when you saw him. I can see no evidence of the original trouble being present."

Case XI.—Was seen by one of us in consultation with Dr. Marie Formad. A short time before the examination a carcinoma of the uterus and ovaries had been removed by Dr. Formad. Numerous minute carcinomatous nodules were found in the peritoneum and could not be removed.

A short time after the operation she began to have constant

headache, either in the right or left side of the forehead. She also vomited considerably and had occasionally dizziness.

When examined she understood all that was said to her, but at times her mind seemed a little cloudy and she did not grasp immediately the meaning of a remark made to her. She was not aphasic, although at times she had difficulty in pronouncing the word she wished to say and frequently stuttered. Her enunciation was distinct. She could count fingers correctly with each eye, but she acted as though her vision were not entirely normal.

The pupils were equal and the iritic response to light prompt in each eye. Extra-ocular muscles were normal. There was no hemianopsia. There was a slight weakness in the distribution of the right facial nerve as shown by the incomplete elevation of the brow and of the corner of the mouth on that side. The masseter contracted well on each side and hearing was good. There was no rigidity of the neck and movements of the head were free.

The upper limbs were well developed and power was about normal. The biceps and triceps tendon reflexes were prompt on each side, probably a little prompter on the right side. The tonicity of the muscles was about normal.

The lower limbs were distinctly weak. The patient could perform all movements, but had little power if any resistance was offered. The tonicity of the muscles was about normal. The patellar reflex was exaggerated on each side, and there was a tendency to patellar clonus on each side; but the clonic movements were abortive and soon ceased. The Babinski reflex could not be obtained because the patient was very ticklish on the soles of the feet. There was no atrophy of the limbs.

Sensations for touch and pain were normal all over the body. Constant involuntary jerkings of each side of the face were present during the examination, jerkings were present also in both the upper and the lower limbs, but not so constantly as in the face. Gait and station could not be tested because the operation had been too recent. The patient improved considerably under treatment.

The symptoms in this case appeared after the operation, and it is probable that the disturbance of circulation caused by the operation increased the dissemination of the toxic substance from the numerous carcinomatous masses remaining in the peritoneum.

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A NOTE ON THE TEMPORARY DISAPPEARANCE OF THE SENSORY SYMPTOMS IN SYRINGOMYELIA.¹

BY CHARLES W. BURR,
OF PHILADELPHIA.

Not infrequently in syringomyelia the areas insensitive to temperature and pain vary in size from time to time. Their boundaries widen and contract. Successive examinations in the earlier period of the disease and even several years after the establishment of the diagnosis will very often show variations in the extent of the anesthesia. The areas do not always steadily increase in size as time passes but may increase and decrease for sometime before a permanent condition is reached. More striking still, and so far as I know attention has not been directed to it, sometimes in the earlier stage of the disease and even after it has existed several years, insensibility to pain and temperature may disappear entirely for a time and then reappear. My attention was first called to the matter about six years ago by the following circumstance: A gentleman presenting some, but not very marked wasting of the hands and forearms, with weakness corresponding to the amount of atrophy and with increased knee-jerks but without any other sign of disease in the legs, was examined by a skilled physician who found loss of temperature and pain sense without tactile anesthesia. The diagnosis of syringomyelia was made. Several months later I saw the patient and on examining him found no anesthesia whatever. I knew from the history of the case that anesthesia had been previously found but though I had a high regard for the skill of the physician who had previously examined him, I saw no escape from concluding that there had been an error in observation, and made a diagnosis of progressive spinal atrophy. Several months later I saw the patient again, and was astonished to find that there was complete insensibility to pain and temperature on both arms. Since then I have seen two other cases in which the same thing occurred. In neither had the disease progressed enough to cause any very

¹Read at the meeting of the Philadelphia Neurological Society, March 26, 1906.

marked symptoms in the legs. In none of the cases have I been able to verify the diagnosis by autopsy, but clinically they were all three classical examples of the disease. I think that the explanation is that for some time the gliosis may merely push to one side and compress more or fewer of the nerve elements before destroying them, and that the pressure varies with changes in the circulation, just as happens in tumors of the brain. It is very possible also that the amount of fluid in the cavity varies from time to time, and thus also causes variation in pressure. That relatively quite large solid tumors arising within the spinal cord may cause few symptoms, is shown by the reported cases of sarcoma in which the nerve elements were merely pushed to one side by the soft and slowly growing tumor mass, and the resulting symptoms were nothing like so serious as the gross appearance of the cord would indicate.

THE SPHINCTER REFLEXES IN TABES DORSALIS AND PARESIS.¹

BY COLLIER F. MARTIN, M.D.,
OF PHILADELPHIA, PA.

During the past few years, I have been particularly interested, while examining patients suffering with rectal diseases, in the investigation of the condition of the sphincteric reflexes in cases of nervous diseases involving the posterior and lateral columns of the spinal cord, particularly in tabes dorsalis and in those cases of paresis showing tabetic symptoms.

In several cases of locomotor ataxia it was found that when the finger was introduced into the rectum, firm pressure on the sphincters, in a lateral direction, would cause them to relax. The lower portion of the rectum could then be viewed without resorting to the use of a speculum. This loss of the normal sphincteric tone, in tabetic cases, led me to extend my researches to other nervous conditions, particularly to paresis, in which tabetic symptoms, frequently associated with more or less incontinence of feces, appear late in the course of the disease.

This led to a further and more detailed investigation of the subject. In a series of twenty-eight paretics, the loss of muscle tone was found in twenty-four. In one case the contraction was normal and in three cases the condition of the muscle was doubtful. In two doubtful cases of paresis, the condition was present in one and doubtful in the other. In one case of paranoia and in two cases of chronic dementia the reflexes were normal. Eight cases of locomotor ataxia gave positive evidence of lessened myotatic irritability. A doubtful case of tabes dorsalis showed a decided relaxation of the external sphincter, associated with a redundant condition of the anal skin.

In three cases of ataxia the relaxation of the external sphincter was quite noticeable, although the disease was in an early stage. This absence of the normal contraction is apparently caused by a lessened myotatic irritability associated with a sensory paralysis, more or less pronounced, involving the cutaneous

¹Read before the Philadelphia Neurological Society, April 24, 1906.

margin of the anus and the rectal mucosa. In paresis this condition is not so marked except in those cases presenting tabetic symptoms.

In four cases of ataxia, the other symptoms were associated with frequent attacks of agonizing pain in the rectum, probably examples of rectal crises.

The rectal pain referred to in these cases deserves special mention. The pain was lancinating in character and frequently agonizing in intensity. In all cases it apparently began suddenly, with no warning, and lasted from a few seconds to several minutes, disappearing suddenly and completely. The time bore no relation to the condition of the rectum, whether before or after defecation, and the expulsion of flatus caused no relief.

In examining these cases, the internal sphincter shows considerable power, but upon strong pressure there is no corresponding contraction of the external sphincter, which, under normal conditions, contracts firmly about the finger, preventing a view into the lower rectum. When the finger is inserted into the normal rectum the sphincters can be felt to contract firmly about the finger, the rhythmic character of the contractions being quite noticeable. In the tabetic case this rhythmic contraction is entirely absent.

The ataxia anus, at times, presents another peculiarity well worth noting. After the anus has been dilated by firm pressure with the finger, when the finger is removed the sphincter remains relaxed and does not immediately contract as one would expect. This is apparently due to the loss of muscle-sense, leaving the patient unaware that the muscle is relaxed.

There is another condition which may easily be mistaken for a sphincteric paralysis, and that is where there is a deficient development of the sphincters, a condition frequently associated with procidentia recti. Pressure on the sphincters in these cases, will give the same view of the lower rectum, but the rhythmic contraction, mentioned above, can usually be felt, and a careful examination will reveal the true condition.

In many cases with lessened sphincteric tone, the anus appears funnel-shaped, due to the complete relaxation of the external sphincter, while at the same time, the margin of the anus is devoid of the radiating folds usually seen in the normal subject. The perineal region, as well as the underwear of the

patient is frequently soiled with traces of feces and mucus which have leaked through the anus without warning. Because of the relaxed condition of the external sphincter, the skin at the margin of the anus often seems redundant and baggy, simulating the appearance noted in some cases of procidentia. Indeed, a prolapse of the mucosa is sometimes seen in these cases. At times these folds of skin may be conspicuous by their absence, giving the anus the typical infundibuliform appearance, ascribed to cases practicing passive pederasty. These conditions do not indicate the practice of pederasty as strongly as they point to the sensory paralysis due to a degeneration affecting the nerve supply of the muscular mechanism. Sexual perversion and mental abnormalities and the rectal conditions I am describing may be considered, at best, as independent results of symptoms having a common source.

In reading over the more recent publications upon rectal diseases, I fail to find any specific mention made of this sphincteric paralysis, which is essentially sensory in type. Tuttle (p. 926), says: "Spasm and pain about the rectum are not infrequently symptoms in the beginning of locomotor ataxia; and in many cases the pains occur in the rectum before they do in the legs and sciatic regions." My own experience has been that extreme spasms in the sphincters is usually absent in tabetic cases, although there is a certain amount of tenesmus present during an attack of rectal pain, simulating, to a certain degree, that produced by a sphincter-spasm. Most cases suffer intensely from constipation, necessitating the persistent administration of laxatives. In spite of this constipation, there is a sense of rectal discomfort. The patient has a bearing-down sensation suggesting a desire for stool. The attempt at having a stool is usually unsuccessful and no relief is obtained from the symptoms. In one case of tabes this discomfort was temporarily relieved by divulsion of the sphincters but in a few months the condition was worse than ever.

Allingham states that "in the beginning of mania one often observes the patient has severe pains in the rectum without any pathological condition to account for the same." In no place do I find that he mentions a paralysis of the sphincters, except as an accidental condition, due to injury or to some obscure nerve disturbance. He does, however, mention a lessened degree of the sensation in the rectum, in cases having sclerosis of the pos-

terior columns of the cord, producing a condition of partial incontinence. In all probability an examination of these patients would reveal the condition mentioned in this article.

In *tabes dorsalis*, this sphincteric paralysis with its associated loss of muscle tone, may be noticed before any of the other phenomena become apparent. Frequently there can only be found a slight diminution of the pupillary reflexes while the patellar reflexes show little if any change. Cutaneous, articular and muscle sensations will probably show some impairment if a careful examination be made.

When a case is found with any abnormal depression of the sensory functions of the anus, while not proof positive of a tabetic condition, the other reflexes should be tried. Whether this sign will be of any value to the neurologist remains to be seen, but to the proctologist it is of great importance. Should any operation be performed upon the rectum or anus, where it is necessary to divulse the sphincters, the surgeon may be blamed unjustly for causing incontinence. In cases of ataxia suffering from rectal crises, a divulsion of the sphincter, in a few instances, will give temporary relief, but the pain soon returns, accompanied by an ever increasing paralysis of the sphincters, so that it is a grave question under what circumstances we are justified in operating on these cases.

To summarize, it may be said that, in certain cases, notably in paresis and in *tabes dorsalis*, there is an interference with the sensory distribution to the nerves supplying the sphincters, characterized by loss of muscle tone.

In certain cases there is an infundibuliform appearance of the anal aperture. There may also be partial or complete incontinence, due to the relaxed condition of the muscles and to the more or less complete loss of sensation of the rectal mucosa and contiguous structures. This leakage or partial incontinence is, of course, caused by the absence of sensation in the rectum, so that the patient is unaware of the fact that his bowels should be evacuated. This incontinence is of the same type as the condition of the bladder which we call "paradoxical incontinence." It may be so pronounced that a complete bowel movement may take place before the patient is aware of the fact that he has a stool in his rectum.

Attacks of severe pain in the rectum, unaccompanied by any

definite anal or rectal lesion, and associated with a relaxed external sphincter, should create in the mind of the examiner, a suspicion of a beginning tabetic or paretic condition and a very careful examination of the other reflexes should be made.

This sensory paralysis of the sphincters may be found in nervous conditions other than *tabes dorsalis* and paresis, but I feel confident that this loss of reflex points definitely to some pathologic process in the nervous mechanism controlling the action of the sphincters, and may give some valuable information in making a diagnosis, both from the standpoint of the neurologist and of the proctologist.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY.

January 2, 1906.

The President, DR. JOSEPH FRAENKEL, in the Chair.

A Case of Neurasthenia, with Exophthalmos.—Presented by Dr. William M. Leszynsky. The patient was a woman, thirty-five years old, who was sent to Dr. Leszynsky two years previously with the diagnosis of Graves' disease. After examination, Dr. Leszynsky concluded that the diagnosis had been made solely upon the marked protrusion of the eyeballs, as the other classical symptoms of Graves' disease were entirely lacking. Her general symptoms were of the neurasthenic type, and the exophthalmos was due to a high degree of myopia. The patient's vision was much impaired. The pulse rate ranged between 72 and 74 per minute.

The President, Dr. Fraenkel, said the older writers had distinguished between two forms of protrusion of the eyeball; one they called exophthalmos, and the other buphthalmos, under which title they included a permanent enlargement of the entire eyeball.

Report of Two Cases of Polioencephalitis, with Autopsies.—By Dr. Nathaniel Bowditch Potter. In connection with the report of these cases, Dr. Potter showed a third case, a colored woman, forty-one years old, a laundress, who was admitted to the New York Hospital in February, 1901. She gave a history of having had four miscarriages, and one child that survived three months. Denied syphilis, secondaries, and the use of alcoholic stimulants. She was brought to the hospital in an ambulance, having been found on the street in a comatose condition, with a bottle containing about two ounces of what was probably wood alcohol in her possession. Her stomach was emptied, and the washing smelled strongly of the same material. The breath also contained a strong odor of wood alcohol. The pupils were unequal, the right somewhat contracted; the left moderately dilated. The urine contained a heavy trace of albumin, numerous granular casts, many pus and epithelial cells. After washing out the stomach, the patient could be partly aroused. Slight impairment of power on the right side was noticed. She gradually improved, and left the hospital on March 3, 1901.

The patient was re-admitted to the hospital on Sept. 20, 1905, with the following history: Two days before admission, while working, she suddenly began to feel "funny," as though her legs could not support her, and then sank down on the floor. She did not lose consciousness, and in a few moments got up and went to bed. There was neither pain nor weakness, but on attempting to walk, she found that she could not do so without assistance. There was considerable mental confusion, which had persisted.

There was slight asymmetry of the face. The left pupil reacted slightly and rather sluggishly; the right reacted promptly; there was slight nystagmus. She had an ataxic gait. The knee jerks were exaggerated, the right more so than the left; no ankle clonus; no Babinski; no impairment of sensation. This case, Dr. Potter said, was apparently one of polioencephalitis of the Wernicke type. In addition to the methyl alcohol poisoning as a cause in this case, it was interesting to know that the patient had probably had syphilis.

Dr. Conner sent the patient to the City Hospital, where she was ad-

mitted on Oct. 25, 1905. Her mental condition gradually improved up to the present, and now she is reasonably intelligent in regard to time and place. She has been much less ataxic than is evident at present. The effort of the trip from the City Hospital has fatigued her somewhat. She exhibits a smooth atrophy of the base of the tongue.

Two other cases of polioencephalitis were reported by Dr. Potter. Both of these were observed at the City Hospital during the past eighteen months, and in both, autopsies were obtained. The first case was that of a married woman, forty years old, a native of Hungary, who was admitted to Dr. Child's service at the City Hospital on Sept. 20, 1904. She had four children, the first twelve years ago; the last five years ago. There was a history of one miscarriage, six years ago. The patient was addicted to the moderate use of alcohol.

Three weeks before admission she began to complain of headaches, dizziness and vomiting. When she was first seen by Dr. Potter, on Sept. 23, 1904, she was in a semi-comatose condition, and resisted interference, especially on moving the head. She was well nourished and fairly muscular. The pupils were equally dilated, and reacted sluggishly to light and accommodation. The teeth were covered with sordes, the breath was foul and somewhat urinous. The pulse was rapid and regular, with slightly increased tension. The reflexes were much diminished. Kernig's sign was present; more marked on the right side; Babinski absent. The urine, with a specific gravity of 1019, contained a trace of albumin, and a few hyaline casts. By lumbar puncture, two drams of clear serum were withdrawn under no pressure; this fluid contained a few cellular elements, but no organisms were found. On Sept. 26, the patient was brighter; she could readily be persuaded to show her tongue, and the contracture of the right eyelids had vanished. There was a slight, paralytic ptosis of the left eye. Kernig's sign was absent. The pupils were dilated, the left being larger than the right; they failed to react to light. There was slight flaccidity of the right side of the face. The reflexes of the lower extremities were absent. The plantar reflexes were flexor in type. On Sept. 27 the patient was more comatose, and she died on the following day.

Autopsy: The meninges were intensely congested, but the brain surface was dry. The base of the brain was moderately edematous. The pia was deeply injected, and distinctly hemorrhagic and cloudy in places. The brain surface, as a whole, was rather pale and firm. The vessels were firm, and apparently numerous thrombi were diffusely distributed through the gray and white matter. The color of the cortex varied; it was mostly cloudy and gray, but frequently a diffused grayish pink or even a decided red. The basal ganglia anteriorly were cloudy gray, but not hemorrhagic; posteriorly, there were frequent thrombi with large perivascular spaces. In the pons and fourth ventricle the vessels presented the same condition. The cerebellum was in the same condition as the cerebrum. There was no edema of the spinal cord. The pia was injected, the superficial vessels being prominent and rather soft. In the cervical region, the gray matter was almost liquefied, of a pinkish-gray color, with a deep injection of the vessels. In the dorsal region the gray matter was more distinctly pinkish. In the upper lumbar region the gray matter was almost entirely liquefied, and intensely hemorrhagic.

The second case reported by Dr. Potter, for which he was indebted to Dr. Evan Evans, was a male, an Italian, thirty-seven years old, married, who was admitted to the City Hospital on Sept. 8, 1904. His family history was negative. His occupation was that of a driver. He denied intemperance. In October, 1903, he had a local venereal sore, which lasted one month. There was no history of rash, alopecia or sore throat. The patient stated that this lesion appeared one month after his last coitus. He consulted a physician, who prescribed pills, which the patient took for twenty-five days. He had never had malaria.

The patient stated that in June, 1904, he first began to suffer with

pains in the legs, and dizziness on standing or walking. No pulmonary symptoms nor night-sweats. No marked disturbance of vision; no pain in abdomen. His difficulty in walking was not increased by darkness; there was no paresthesia.

A physical examination of the patient on admission showed a fairly well nourished man. There was a fine maculopapular rash over the body and legs, and an old bubo scar in the groin. The pupils of both eyes were equally dilated; the left responded sluggishly to light, but was normal to accommodation; the right responded to accommodation, but not to light. There was a marked tremor of the tongue; no deviation.

The patient died on Sept. 16, 1904. The autopsy showed the case to be one of acute encephalitis, with a general ascending poliomyelitis. There was considerable edema of the brain, and the gray matter of the cord, as in the preceding case, was soft, pinkish and hemorrhagic.

In both of these cases, microscopic sections showed in the meninges marked congestion, and presented a turbid, hazy appearance, due to inflammatory edema. The vessels were enormously congested, and frequently surrounded by cellular infiltration, partly localized, partly progressing in the lymph and tissue spaces to a more diffuse distribution. The vessel walls showed numerous areas of hyaline thickening. In the neighborhood of some of these vessels, a collection of more elongated nuclei, apparently derived from the fixed tissue elements, was visible. Nuclear remnants in other parts, especially where the meningeal tissue had lost its entire structure, were frequently seen. The brain substance presented a diffusely hazy appearance, with the ganglion cells throughout extensively degenerated; the protoplasm poor in granulation, pale pigment, however, having been retained in a large number. The neuroglia was hazy; free round cell nuclei were diffusely distributed, and the vessels were enormously engorged, sometimes containing a large number of leucocytes, which, in places, lay outside the vessel wall. The perivascular spaces were wide. As a whole, there existed no marked old thickening of these vessels. In places, an active softening and loss of brain tissue could be seen.

Sections of the cord showed practically the same intense inflammatory lesion throughout. The vessels more frequently showed old hyaline thickening. The destruction of the white matter was quite irregular throughout, and did not show any localized involvement of definite tracts.

An examination of the rest of the organs in the body showed acute parenchymatous degeneration, and the kidneys presented an acute hemorrhagic nephritis.

The autopsies and sections were made and reported upon by Dr. Horst Oertel, pathologist to the City Hospital.

Dr. J. Ramsay Hunt said the woman showed by Dr. Potter had been seen by him some months ago at the New York Hospital. Previous to that time the patient had been examined in the very acute stage by Dr. Ward A. Holden, who had made the diagnosis of polioencephalitis superior. When Dr. Hunt saw the patient, she was somnolent and much confused mentally. There was marked ataxia, of the cerebellar type; the intrinsic muscles of the eye were normal, and the reactions were fairly prompt. There was no ptosis, but some weakness of the internal and superior recti on both sides, and the ocular excursions were accompanied by coarse nystagmus.

Dr. Hunt said he had seen two other cases of polioencephalitis at about the same stage as this woman was in, and he emphasized the importance of the recognition of the condition, in order to avoid confusion with other cerebral affections, especially syphilis. In both cases, weakness of the extrinsic muscles of the eye, diplopia, nystagmus and cerebellar ataxia characterized the clinical picture, following prolonged alcoholic debauches and delirium.

Six months ago, Dr. Hunt said, he saw a typical case of polioencephalitis

of the Wernicke type. This he was able to follow to the autopsy table, and he had reported the case in full at the last meeting of the American Neurological Association. The onset was acute, with headaches, delirium, ataxia, and paralysis of the third and fourth cranial nerves. Later, bulbar symptoms were superadded, the patient dying on the fifth day. The brain was subjected to a careful histological study, with numerous sections through the medulla, pons and thalamic regions, and the only lesions found were microscopic hemorrhages and small collections of round cells, both in the pons and the medulla.

The lesions in these cases, Dr. Hunt said, were not restricted to the gray matter. In his original description, Wernicke regarded the condition as a polioencephalitis, but of some thirty cases, with histological studies, which the speaker said he had been able to collect in literature, almost one-third showed disseminated lesions both in the gray and white matter, so that it was more proper to regard these cases as a disseminated encephalitis. Cases of this type (Wernicke) also presented combination forms and transition states to the polioencephalitis of the Strümpell-Leichtenstern type, and encephalitis in general.

Dr. Harlow Brooks said that some years ago he reported a case similar to the one referred to by Dr. Hunt. The lesions were not confined to the gray matter, but were also in the white matter. The etiological factor in this case, Dr. Brooks said, was apparently some coal tar product, probably antikamnia. The case was a rapidly fatal one, and the symptoms were rather more acute than in the case shown by Dr. Potter. Otherwise, it was practically the same.

Dr. Potter said he had shown and reported these cases on account of the comparative rarity of the condition, and the interest that attached thereto. He inquired as to the importance of syphilis as an etiological factor. In many of the cases where alcoholism had been assigned as the causative factor, there was a preceding history of syphilis.

Dr. Hunt said the consensus of opinion seemed to be that alcohol was the commonest etiological factor in these cases. While there was often a history of syphilis, the connection between that disease and polioencephalitis was not as distinct as it was to alcoholism. There were also other factors which apparently bore some relation to it, but they were more or less obscure, and suggested a toxemia.

An Analysis and Report of Thirty Cases of Epidemic Cerebrospinal Meningitis.—Dr. William M. Leszynsky read a paper on this subject, and presented eight of the cases, with a brief history of each. Of the thirty cases reported, fifteen had recovered. Among the cases shown there was one boy who had lost the sight of one eye through an iridochoroiditis, and another who became totally and permanently deaf on the second day of the disease. In the other cases shown, the recovery was apparently complete.

Dr. Edward D. Fisher said that most of the cases of epidemic cerebrospinal meningitis that had come under his observation had been in patients who were older than the cases reported by Dr. Leszynsky. He had seen very few cases in children. The treatment was practically limited to good nourishment, spinal tapping, and, in some cases, the administration of the salicylate of sodium.

As regarded the prognosis of the disease, Dr. Fisher said it should be made with great caution, and the seriousness of the case could not always be judged by the eye symptoms. The most serious cases sometimes recovered, while the apparently mild ones not infrequently died. The prognosis improved with the abatement of the epidemic.

In speaking of protracted cases, Dr. Fisher referred to one of almost nine months' duration. In that case, convulsions were a prominent feature. The patient was apparently on the road to recovery, when he had a third relapse and died.

Dr. Arthur C. Brush, of Brooklyn, N. Y., said he had seen many cases of cerebrospinal meningitis during the recent epidemic, and he could con-

firm all that Dr. Leszynsky had said in regard to the erratic course of the disease. At times, the most desperate cases recovered, while the apparently hopeful ones suddenly died. The treatment, so far as he was concerned, was entirely symptomatic.

Dr. Brush said he was surprised to learn that deafness had resulted in so few of Dr. Leszynsky's cases. In his own experience the percentage of deafness was much higher. Another possible sequela that should be borne in mind was epilepsy, coming on a year or two after the termination of the disease.

Dr. Harlow Brooks said he had long regarded cerebrospinal meningitis as a neurological disease, and it appeared from the number of cases reported by Dr. Leszynsky that the neurologist was at last coming into his own. The results given by the reader of the paper were decidedly more favorable than we were accustomed to look for in dealing with these epidemic cases, and it was a very impressing demonstration to see so many cases recover without serious sequelæ.

Dr. Brooks said that an important contribution to the pathogenesis of cerebrospinal meningitis had recently been made by Dr. E. K. Dunham, of the Meningitis Commission, which might eventually lead to a more enlightened method of treating the disease. A chemical substance had been discovered to be formed by the meningococcus, which belonged to the hemorrhagins. This causes a solution of the endothelial cells in the walls of the blood vessels, and was supposed to be responsible for the enormous exudates that were so characteristic of the early stages of cerebrospinal meningitis.

Dr. Edwin G. Zabriskie said that actuated by an article by Tretrop, in the *Annals of Otology, Rhinology and Laryngology*, March, 1905, on the results of treatment in cases of deafness, vertigo and tinnitus by the Babinski method, several surgeons at the Manhattan Eye and Ear Hospital had requested lumbar puncture for bilateral deafness following cerebrospinal meningitis. Lumbar punctures were made at intervals of from five to ten days on about twelve cases, without any relief as regarded the deafness.

Dr. Leszynsky, in closing, said that lumbar puncture could not be expected to affect the deafness in these cases, as it had been demonstrated in fatal cases that the loss of hearing was due to infiltration and complete destruction of the aural nerve. In a few instances, perhaps, it was due to inflammation of the middle ear.

The following officers were elected for the ensuing year: President, Dr. Joseph Fraenkel; First Vice-President, Dr. Adolf Meyer; Second Vice-President, Dr. J. Ramsay Hunt; Recording Secretary, Dr. Edwin G. Zabriskie; Treasurer, Dr. G. M. Hammond; Corresponding Secretary, Dr. F. K. Hallock; Councillors, Dr. M. Allen Starr, Dr. Charles L. Dana, Dr. Joseph Collins; Dr. J. Arthur Booth and Dr. William M. Leszynsky.

February 6, 1906.

The President, DR. JOSEPH FRAENKEL, in the Chair.

Case of Carcinosis of the Brain and Cord.—Dr. Walter Timme reported this case, and showed the specimen. The patient was a married woman, who was forty-three years old at the time of her death. She was the mother of several healthy living children. In 1899 she developed an ulcer of the leg, which resisted all forms of treatment for about a year, and then healed within a few weeks under dram doses of potassium iodide. Syphilis was denied. In 1901 she was operated on by Robert Abbe for a typical scirrhus carcinoma of the left breast, and the breast, pectorals and axillary lymphatics were removed. In October, 1903, two years after the operation, there were no evidences of a recurrence in the scar or elsewhere, and the patient was apparently in excellent health, with the exception of

neuralgic pains at the site of the right fifth and sixth intercostal posterior roots, and in the side. At this time, the diagnosis of spinal metastasis of the dura and nerve roots was made by Dr. Abbe, and it was necessary to begin the use of morphine to relieve the pain. The patient was not bed-ridden, but the pain was very severe, and the use of morphine and anodynes was constantly necessary.

During the year 1904, one consultant after another was called in, and none agreed with the original diagnosis of spinal metastasis. The diagnosis was variously made as pure neuralgia, neuritis, hysteria, neurasthenia, or a combination of these latter conditions. The patient developed a slight convergent squint, which was accentuated after the administration of morphine. X-ray and radium treatment were given a trial, without any benefit. Morphine was constantly resorted to, although in small doses.

The patient was first seen by Dr. Timme on Sept. 2, 1905. Her general condition was good. Her facial expression gave one the impression that she was suffering real physical pain, and this was the only symptom for which she asked relief. This pain was in the nature of an intense rachialgia at the base of the spine, thence radiating for a short distance up the spine, and downward along the course of both sciatic nerves. She complained of practically nothing else. A minute after a hypodermic of morphine was administered she was smiling and free from pain. There was no headache; no vertigo; no nausea; no vomiting. The appetite was fair; the mental condition excellent. There was an area of alopecia on the left side of the head, about the size of a silver half dollar. This was subsequently found to correspond exactly with the position of one of the tumors lying directly underneath that part of the vault. The skin of the entire body had imbedded in it discrete, non-inflammatory masses, about the size of a hazel nut. The scar of the operation was in perfect condition, and no glandular enlargements could be made out. The heart, lungs and other organs seemed normal. An examination of the urine showed a large excess of phosphates, but was otherwise negative. The entire spine was hypersensitive, and at the level of the fifth, sixth and seventh vertebræ, pressure elicited shrieks of pain. This symptom remained constant. There was a band of anesthesia around the abdomen, varying in width and position daily. On either side of this band was an area of paresthesia. There was no loss of knee jerks. Both pupils were contracted, though they were not of the Argyll-Robertson type. The left eye showed some nystagmus. There was ptosis of the left lid, and a slight convergent squint. The tongue deviated markedly to the left, though the patient could correct this somewhat upon trial. The temperature of the right hand was always two degrees higher than that of the left. Almost all the usual symptoms of hysteria were ingrafted upon the foregoing; thus, the globus, the insensitive corneæ, the craving for sympathy, the hysterical crying were all present. There was slight thickness and slowness of speech. Deglutition was also slow, and necessitated effort.

The patient was given a vigorous course of anti-syphilitic treatment, without any improvement. Early in October, 1905, the morphine was discontinued. The patient, after the first few days of extreme agony following its deprivation, began to show signs of improvement. She complained less of her backache, and appeared brighter. However, her speech became somewhat thicker, and deglutition was more difficult. On Oct. 14 her breathing became labored, and the temperature rose to 103. By the following morning, cyanosis had developed, and the patient could now be aroused with difficulty. The respirations rose to 72 per minute, and the rectal temperature to 107, 108, and finally to 109.5. The pulse rose to 150 per minute; edema of the lungs set in, and death soon supervened.

The autopsy showed secondary general carcinosis of the brain, spinal cord, lungs, ovary, skin and vertebræ. In the brain there was a tumor on the inner surface of the dura, pressing upon the left cortex. It was about an inch and a quarter in diameter. It was located above the Sylvian fissure, and rested

on the posterior, upper part of the inferior frontal, and the lower, posterior part of the middle frontal, and on the inferior part of the post-central and the anterior central gyri. A larger tumor, two and a half inches in diameter, was found on the base of the brain, extending from the left frontal region posteriorly to the orbital plate. This tumor had involved the bone in the immediate vicinity. Both tumor masses had indented the brain tissue by their constant growth. The spinal cord, from the fourth cervical vertebra to the cauda equina, was notably compressed by a metastatic growth extending along the dura mater spinalis. The vertebræ, in several places, were infiltrated and spongy. The nerve roots were involved by carcinomatous infiltration, especially in the upper dorsal region. The microscopical examination of the various metastatic growths showed carcinomatous characteristics.

In concluding the history of this case, Dr. Timme called attention to the fact that although this patient had been examined by five or six competent neurologists during the past two years, the diagnosis they made varied from "pure hysteria" to "neuritis based upon morphinism," and in only a single instance did the opinion come near the truth. When Dr. Joseph Fraenkel saw her in consultation about two years ago he expressed the opinion that she was suffering from a metastatic growth of the cord. His diagnosis was arrived at by exclusion, and nothing was said of any possible brain involvement. In view of the extensive interference with the cerebral cortex, one could but wonder at the paucity of signs and symptoms presented during life.

Dr. Edward D. Fisher, in discussing Dr. Timme's case, said that so far as the growth in the frontal lobe was concerned, it could be well understood that a tumor might exist in that area without causing any mental or physical disturbance. In regard to the second tumor in the motor area there are many cases on record where large growths in that region have given rise to few or no symptoms. He recalled one case of that character, where the presence of the tumor was verified by operation, in which there were no motor symptoms, and even optic neuritis was absent.

The spinal symptoms mentioned by Dr. Timme were simply the effects of pressure, and should have led one to suspect the presence of a malignant growth involving the cord.

Dr. Fisher said he was entirely in accord with the suggestion made by Dr. Timme that a consulting physician should not be expected to base his diagnosis upon a single examination.

The President, Dr. Fraenkel, said that with the better knowledge of neurology, the diagnosis hysteria was becoming less frequent.

In the case reported by Dr. Timme, Dr. Fraenkel said he had made the diagnosis of a metastatic growth of the cord three years before the patient's death. The chief symptom upon which he had based the diagnosis was the permanent neuralgia, which was in the strict anatomic distribution of an intercostal nerve. Further, on the fact that the organic nature of the neuralgia was proven by a border of anesthesia above and below this nerve. This, in conjunction with the history of the removal of a carcinoma from the breast, made the diagnosis relatively easy.

Discussion of the Data Concerning Neuro-Fibrils, with Illustrations.—Dr. Adolf Meyer, at the request of the President, gave an illustrative demonstration of the data present in the literature concerning the problem of neuro-fibrils. It forms the most prominent issue of the histological side of neurology, and while not as fascinating as the matters which are more directly accessible to experiment, it is an issue worth careful review to prevent the tendency to draw speculative conclusions in a field in which the microscopist is so easily influenced by what he wishes to see. It is indeed impossible to understand the discussion of the neuro-fibrils without due consideration of the setting in which the orthodox theories of neuro-fibrils of Apàthy, Bethe and Nissl arose. There is no doubt that the neurone speculation came at a time when the cell-concept and the ideas

concerning syncytia and cell-bridges and intercellular substances had a special fascination, as is shown in Weigert's attitude concerning neuroglia.

Dr. Meyer pointed to the remarkable findings of Deiters, to the diffuse net of Golgi, which was ignored by most workers with his method in favor of the simpler tree-simile, then the return to the study of the nerve-cell protoplasm, the discovery of fibrils by Becker, and the gradual development of Bethe's views and their relation to Apáthy. The demonstration of non-anastomosing fibrils in the majority of cell bodies and processes and the existence of nets in the spinal ganglion cells, and a few other types; the probable independence of the fibrils, their isolation in the Ranvier rings, the demonstration of primary stainability of the fibrils, the gradual shifting in the interpretation of the relation of the Golgi net to the extra-cellular and intra-cellular fibrils. With Bethe's results he contrasts those of Donaggio, with a fibril net prevading the whole cell-body and fibril bundles in the dendrites, and the importance attached to the cell-body as a place of reception and synthesis of stimuli. Rossi's pictures are referred to as showing wholly incomparable meshes throughout the cell-body; Bielschowsky, as showing conditions more nearly identical with Bethe's results, but also with rather frequent perinuclear net-work; and Cajal, as giving fibrils and nets, and especially clear, a wonderful system of end-feet of the fibrils terminating on the cells.

This was followed by a review of the history of Held's end-feet, of the Golgi net, of the terminal nerve-net, and the controversy concerning the transition of fibrils from the end-feet into the cell-body. It was shown how much the pictures furnished depend on the general histological views of the writers, and how fallacious it would be to attribute too much importance to these, as yet, conflicting data. Schaffer's generalizations from his findings in amaurotic idiocy are added as an additional instance of the determination of the views of the writers by previous work or special observations. The conflicting ideas concerning the embryological origin of fibrils was next brought out, and also the very conflicting statements in such a clear cell-alteration as the axonal alteration in the descriptions of Bethe, of Donaggio and Marinesco and Bielschowsky. For the time there seems to be no evidence that the fibrils are anything but a special adaptation of the local protoplasm. The idea of fibrils "going in" is hardly supported. Where there are changes in the fibrils there are almost invariably other changes in the local protoplasm. The method of Bielschowsky is probably the most useful for routine work and comes nearest to the histologically most convincing pictures of Bethe; and that it gives valuable data of anomalies of structure not observed with other methods was to be shown in the demonstration of specimens by Dr. Lambert.

Dr. C. I. Lambert, presenting the neuro-pathological application of the several fibril methods, gave a comparative résumé of the ones most adapted to this kind of work.

Donaggio's method is not to be especially recommended. Dugaro's substitution of colloidal silver for Joris' gold colloid promises little more. However, his axis-cylinder method with Bethe's blue or Mallory's iron-hematoxylin method gives very satisfactory results. More dependence is to be placed upon the silver methods of Cajal and Bielschowsky, which are more certain, uniform, and more nearly identical in their respective cell renderings. Cajal's method, with its several modifications, although usable in pathological conditions, is essentially a method for normal histology. The uncertain character of *en masse* impregnation, the lack of uniformity in the individual nerve cell reactions, even under normal conditions, do not permit of equally trustworthy comparative work under anomalous conditions, where too frequently there is a minimum amount of available material, often improperly fixed. However, the successful Cajal picture is full of refined detail, and for normal cell morphology is par excellent. On the other hand, the frozen section methods of Bielschowsky for cell and fibre studies lend themselves readily to the neuro-pathologist.

The directness of the method, the comparative ease in manipulation and control, the uniformity under comparable conditions, recommend its use where more intimate details and a fibril equivalent is desired.

About thirty lantern slides were shown illustrating cell types after Cajal's and Bielschowsky's methods in normal and pathological conditions.

Briefly summarized, in general paralysis, the cortex-width and lamination, and the general and focal disturbances, are easily demonstrable by these methods, especially Bielschowsky's. The form and intrinsic nerve cell structure, and its relative integrity, is exceptionally well rendered. Swelling of the interfibrillary substance, with more or less gluing together of the fibrils, apparent fragmentation and granulation of the intra-cellular neuro-fibrils, varied by a frequent vacuolar or gitter-like appearance of the cell-structure with a contrary, shrunken and stumpy distorted appearance of the dendrites, and a more or less granular and opaque nucleus, are among the most notable changes.

In senile dementia, the cell shows a more uniform character, with less distortion, and only a fair fibrillary structure is preserved. The cell picture is generally darker, the fibrils are frequently matted, fragmentary or granular; the nucleus is often negative, or not infrequently more or less opaque and granular. The pigment masses are often notably increased in the smaller as well as the larger pyramids; their reticular net is often coarse and lumpy.

A cell-picture comparable to that of senile dementia is seen in the external geniculate in optic atrophy. Here the question of the plasmatic or fibrillary origin of the net of the pigment mass is not so clear.

In the fever change, naturally or artificially produced, present with the above change or alone, there is more or less apparent fragmentation and granulation of the fibrils corresponding to the Nissl-picture, as described by A. Hoch.

In central neuritis, described by Adolf Meyer in *Brain*, 1901, there is a parenchymatous alteration of the larger cell elements, mainly of central distribution appearing as a typical axonal reaction, with or without other superimposed cell changes. In the Bielschowsky equivalent a disappearance of the fibrils exactly corresponding to the area of swelling in the Nissl-equivalent. This is also shown by the harmony of the picture in the vortex type of this alteration.

The facts presented go to show the advantage of this new means of demonstrating histological details. On account of the variability in the Cajal picture in various parts of the same section and for ease of manipulation the Bielschowsky method has proved of especial advantage. A more intimate knowledge of the nervous structure and the finer histology of its components is promised through its wider use. The neuro-fibrillar structure appears to be quite as susceptible to morbid alterations as does the stainable substance of Nissl. Where the latter suffers the former shows equal changeability. There is abundant reason for reserve in assigning particular physiological attributes to the neuro-fibril.

Periscope

Psychiatrisch-Neurologische Wochenschrift

(August 19, 1905.)

1. Work Therapy in the Cantonal Asylum at Wie. SCHILLER.
2. Family Care in Mauer-Oehling. STARLINGER.

1. *Work Therapy*.—A plea for the more general employment of the insane and an outline of a number of kinds of interesting and profitable employments. Work is useful in both acute and chronic cases and tends to prevent deterioration which is hastened by the indolent tendencies of standing or sitting about indulged in by so many insane and also limits the number of cases requiring treatment in bed.

2. *Family Care*.—A letter describing the family care of the insane at Mauer-Oehling. This method was begun in 1903 and at present with a population in the institution of over 200 patients 80 are thus cared for.

(August 26, 1905.)

1. Psychiatric Reform Ideas. BOGDAU.

1. *Psychiatric Reform*.—An article dealing in a general way with the recent advances in psychiatry, its much greater importance nowadays because of its relation to other subjects such as sociology, alcoholism, the phenomena of nihilism, etc. Recent advances in treatment—the continuous bath—are mentioned, the organization of institutions for the insane, colonization and the personnel of the administrative force. In closing, the author advises that in these days of societies a general psychiatric congress be organized for discussing these general questions relating to insanity.

(September 2, 1905.)

1. The Position of the Insane Asylums. STARLINGER.
2. The Territorial Limits of the Asylums. SCHOTT.

1. *Position of the Asylum*.—This article is an answer to the criticism of the asylum as a place where only chronic, incurable persons are cared for and where there is no activity on the part of the resident physicians. The author is the director of an institution in Austria and defends institutions and broadly outlines the medical work to be done in caring for the insane.

2. *Territorial Limits of Asylums*.—This article is an inquiry into the relative advantages of separate institutions for the acute (Heilanstalten) and the chronic (Pflegeanstalten) insane or institutions for the care of all the insane of all classes from a given territory. The author considers the question from the standpoints of the patients and their relatives, the administration, the hospital itself, and scientific research. He comes to the conclusion, unequivocally, in favor of the institution for all the classes of a given district.

(September 9, 1905.)

1. Death from Convulsions in Katatonia. RUDOLF TETZNER.
2. Origin of the Predorsal Longitudinal Bundles and the Trigemini.
A Contribution to Topical Diagnosis of the Oblongata. OSCAR KOHNSTAMM.

1. *Death from Convulsions in Katatonia*.—(Continued.)

2. *Predorsal Bundles*.—The author reaches the following conclusions:

1. The nucleus intratrigeminalis tecti is the nucleus of origin of the decussating predorsal longitudinal bundles.

2. Lesion of the spinal V root and its nucleus leads to dissociated sensory paralysis and to areflexia of the cornea.

3. The ventral lip of the nucleus radialis spinalis V sends an analogue to the Kl. S. B.

4. The sensory V nucleus of the pons is the analogue of the nucleus of the posterior columns.

5. The axone of the dorsal X nucleus enters the ventral pole of the spinal V root and is destroyed by lesion of this region.

6. The reflected visceral pain of Head in the trigeminal area arises through irradiation from the lateral column nucleus to the nucleus spinalis rad. V.

The letters refer to diagrams in the text.

(September 16, 1905.)

1. In Commemoration of Theodor Meynert on the Appearance of His Poems. PHELPS.

2. Death from Convulsions in Katatonia. TETZNER.

1. Does not lend itself to abstraction.

2. *Death from Convulsions in Katatonia*.—Kahlbaum in his monograph on katatonia in 1874 described epileptiform, choreaic, tonic and clonic convulsions which appeared more or less commonly in the course of katatonia. Kraepelin described syncopal and epileptiform attacks. It is rare to see convulsions in single muscle areas, tetany or apoplectiform attacks with lasting paralysis. Sommer in 1905 described a case of typical katatonia which died from an enormous number of convulsive seizures. The author presents such a case.

The patient, a woman 28 years old, married, two children, was admitted to the hospital November 28, 1901. A detailed clinical record is given typical of dementia præcox. In April, 1902, she suffered an attack of typhoid fever, which was followed by katatonic symptoms which up to this time had been absent. June 2, 1905, she was noticed to be unconscious with stertorous breathing. Shortly after she had convulsions which occurred every 5 or 10 minutes. They were clonic-tonic, general, with wide pupils, froth, involuntary evacuation of bladder, and unconsciousness. She opened her eyes and cried out between attacks but did not regain consciousness. June 3, the seizures continued from eight o'clock June 2 to eight thirty June 3. She had 120 attacks. June 4, two attacks during night, temperature rose to 39.1. At nine o'clock in the evening the convulsions began again and kept up until death, the patient having seventy-one.

The autopsy findings were: Old tubercular deposit in left apex, pneumonia both lower lobes. Brain weighed 1150 g., pia slightly opaque and edematous. The kidneys were normal.

The author discusses the nature of these convulsions. Were they paretic, epileptic, uremic, syphilitic. He discards all of these causes. There were no signs of paresis, no history of epilepsy, no albuminuria and the kidneys were found normal, and no evidences of syphilis. The patient had borne two living children. The conclusion seems forced that the seizures were the commonly occurring in the course of katatonia and due to the same underlying pathological condition producing that disease. The noteworthy feature of the case was their extreme frequency, giving the picture of status epilepticus, and the fact that they issued in death.

WHITE (Washington).

American Journal of Insanity

(Vol. LXII, No. 2, October, 1905.)

1. The Problem of Psychiatry in the Functional Psychoses. COWLES.

2. The Effects of Exercise Upon Retardation in Conditions of Depression. FRANZ and HAMILTON.

3. Dementia Præcox in France with Some Reference to the Frequency of this Diagnosis in America. FARRAR.

4. A Study of Somatic Ideas in Various Psychoses. HOCH.

5. Observations on Ganzer's Symptom. RUGGLES.

Psychiatry in the Functional Psychoses.—In this, an address delivered before the International Congress of Arts and Sciences, at St. Louis in

September, 1904, the author considers from a very broad point of view some problems of psychiatry, the functional psychoses being specified for special consideration, since his evident intention is to emphasize the fact that in the study of insanity we are constantly confronted by a perversion of function, involving not only the nervous system, but the whole organism, and that this needs to be studied not only from the standpoint of pathological anatomy, but also from that of physiology, both general and in its special application to the mental processes, and from that of biology. He sketches the present position of psychiatry as shown by current teachings, and emphasizes its dependence on general medicine, as he has done for years. Our difficulties in conceiving the relationship between physical processes and mental phenomena, also those of expression are not underestimated, and while on account of the fact that most our definitions are based upon a physical view of things, they are faulty from the standpoint of the psychologist, custom has sanctioned them so far that he sees no way of changing them at present. While in no way underrating the contributions of pathological anatomy to psychiatry, the author urges the study of the symptoms of the insane from the standpoint of perversion of function—of pathological physiology—in its bearing not only upon the nervous system, but also upon the other functions, as of secretion, metabolism, and so forth. For the elucidation of some of the problems of mental physiology, he thinks the functional psychoses present a promising field, for the study of a large number of cases of non-deteriorating mental disorders may yield certain general conclusions as to the result, in an originally normal person, of use, disuse, overuse, and stress. He lightly sketches the perversion of mental processes in the functional psychoses, as affecting respectively the feelings, intellect, will, organic sensations and states, and expresses his conviction as to the essential unity at base, of the functional disorders, in their various combinations, producing symptoms conveniently classified as neurasthenia, melancholia, and mania, this tendency toward unification of psychoses being increasingly evident of late years.

2. *Exercise*.—Starting out from the idea that in depressed conditions retardation and feeling of inadequacy are due to lowered irritability, which idea has some clinical support in the fact that depressed patients are generally better in the afternoon, the authors were led to carry out a series of experiments part of which are related here. Two patients, one of middle age and the other older, were chosen, and on alternate days were treated by vibration along the sides of the spine over the nerve exits, the following reactions being noted both on resting and on stimulated days; threshold of pressure and of pain sensation, rapidity of movement, accuracy of movement, and speed of reading. The methods of carrying out these experiments are described and their results are exposed in several tables. The following is their summary. 1. The thresholds of pain and pressure appreciation are higher than normal in a case of retardation. 2. There is a daily improvement in the pressure and pain sensibility coincident with the lessening of the retardation and the depression. 3. The accuracy of movement is not affected by depression and retardation. 4. The speed of movement is lessened in the retarded condition, but it is gradually increased during the period of recovery. 5. Mechanical vibration increases the rapidity of movement, and lowers the pain and pressure thresholds. 6. The speed of mental processes is increased with improvement in the mental condition of retardation. 7. After moderate exercise there is more improvement than after a similar resting period. They conclude that investigations by methods of this kind may be of some practical use in finding definite therapeutic indications. They at least tend to encourage the patient, and they offer a field for investigation which should not be neglected.

3. *Dementia Præcox in France*.—Referring at the start to an attack on the conception of this disease of Kraepelin and his followers, made by Marandon de Montyel—and already reviewed in this Journal—the author

sketches the development of Kraepelin's ideas as to the position of this psychosis and what should be included under it, and discusses the relative views of French and German authors on the subject. He then considers to what extent the teachings of Kraepelin have modified classification in the United States, giving in tabular form the changes in percentages, on the one hand, of mania, melancholia, recurrent and circular insanity, and, on the other, of primary or acute dementia, hebephrenia, katatonia and dementia præcox, as shown by the reports from 1890 to 1904, of nine hospitals all in New York or New England. While evidently an adherent of the Kraepelin School, he does not seem to be carried away by the desire so frequently observed of fitting an excessive proportion of cases to the latest and most popular pattern.

4. *Somatic Ideas in Various Psychoses*.—After quoting from a number of authors as to the influence of disturbance of function and of organic disease upon the somatopsyché, and in the production of false ideas, the author gives the result of his analysis of 1,564 cases of various psychoses. Among these, somatic ideas were present in 221 individuals or 12.85 per cent. This figure he regards as probably too low, since a number of these patients had reached an advanced stage of dementia, and having been many years in the hospital, accurate histories as to their symptoms in the earlier stages of their diseases were unobtainable. As might be expected, the greatest frequency of these ideas was found in melancholia, the percentage being 80.76. Next to this come the paranoid conditions with 26.11 per cent., dementia præcox with 22.4 per cent., and alcoholic insanity with 17.92 per cent., the other psychoses showing much lower figures. Taking up the chief forms of psychoses, the author next enumerates the delusions found, and attempts to trace their mode of production, referring them as far as possible respectively to somatic disease and to the influence of various more or less fortuitous events misinterpreted through altered brain function. The ideas observed reproduce in the main only what is common experience, and the author offers nothing new in the way of psychological explanation. At the end he summarizes in tabular form the relation of somatic ideas—in different psychoses—to physical condition, and the usual reaction of the patient to such ideas.

5. *Ganser's Symptom*.—The author examined at the Butler Hospital 170 patients presenting various psychoses. Among these he found only three individuals, all suffering from dementia præcox, whose answers suggested a "Danebenreden" which he translates as "the symptom of approximate answers." In all of these cases, however, careful and tactful examination brought out the admission by the patient that the answers were given intentionally incorrect as the questions were regarded as more or less foolish and intended to "make a show" of the person to whom they were addressed, hence a contrary attitude was justified. The author concludes that this symptom may be found in a variety of mental states, that its diagnostic importance has been much exaggerated and that it is due to the fact that since the patient is impelled for various reasons to answer incorrectly, he finds it easier to give a reply more or less relevant to the question asked than to branch off on a new train of ideas. ALLEN (Trenton).

Centralblatt für Nervenheilkunde und Psychiatrie

(Vol. XVI., No. 190, June 1, 1905.)

- I. Janet's Work: Obsessions and Psychasthenia. A Critical Comment. Also a Contribution to the Study of Imperative Ideas (Zwangszuständen). MAX FRIEDMANN.

1. *Obsessions and Psychasthenia*.—In a lengthy article Friedmann discusses in detail Janet's work on this subject.

(Vol. XVI., No. 191, June 15, 1905.)

- I. On the Question of "Susceptibility to Suggestion" ("Lenksamkeit"). WILLY HELLPACH.

1. This article is not adapted to abstracting.

(Vol. XVI., No. 192, July 1, 1905.)

1. The Relation of Syphilis to Lymphocytosis of the Cerebro-spinal Fluid and to the Study of Meningeal Irritation. L. MERZBACHER.

1. *Syphilis and Lymphocytosis of Cerebro-spinal Fluid*.—The author studied the results from lumbar puncture in a series of 26 cases. The cases are divided into three groups. Group I.—Patients with distinct history of syphilitic infection or prominent residual symptoms. Group II.—Patients in whom a luetic infection appeared. Group III.—Patients in whom the existence of infection was established and in whom there were present, at the time of lumbar puncture, disturbances on the part of the nervous system. In almost all of the cases examined there was an increase in the cellular elements of the cerebro-spinal fluid.

(Vol. XVI., No. 193, July 15, 1905.)

1. The Nosological Position of Hypochondria. R. WOLLENBERG.
2. Congenital Disturbances of Eye Movements. TH. AXENFELD.

1. *Hypochondria*.—The author reviews the history of the study of hypochondriasis, together with the various definitions of the condition as given by its investigators. In the writer's opinion many cases are but another form of neurasthenia, and on account of the difficulty of separating it from other physical and psychical disturbances, hypochondriasis cannot occupy an independent nosological position.

2. *Congenital Disturbances of Eye Movements*.—The author presents two cases in which there is a complete congenital abducens paralysis of the left eye.

(Vol. XVI., No. 194, August 1, 1905.)

1. Questions in Clinical Psychiatry. EMIL KRAEPELIN.

1. *Clinical Psychiatry*.—Kraepelin notes the great tendency towards the use of convenient as well as the meaningless terms for the purpose of classification, the including of many psychoses under a single head. He appeals for a closer study of cases which are not entirely clear, also the following of cases to their termination, believing that differentiation of the various psychoses, and a better foundation for prognosis can be had only in this way. The article further considers the uncertain clinical position of the alcoholic insanities, and the difficulty in separating some cases from paranoia and dementia præcox, in instances in which there is an associated alcoholism.

(Vol. XVI., No. 195, August 15, 1905.)

1. Concerning Weeping and Emotion. ERNST WEBER.

1. *Weeping and Emotion*.—A discussion of the association of weeping with emotion, with reference to the theories of Darwin and Wundt.

(Vol. XVI., No. 196, September 1, 1905.)

1. Experimental Studies on the Power of Recollection. C. G. JUNG.

1. *Recollection*.—Jung notes the reaction and the time required for the same, following certain stimulus words, and notes the relation of the reaction to the mental complex of the patient. The results are given in tabulated form. Jung believes this method of value in criminal psychological examination. He used this method for the further study of memory and found that the power of recollection is lessened in proportion to the degree of emotion present.

(Vol. XVI., No. 197, September 15, 1905.)

1. A Contribution to the Knowledge of Epilepsy. CLEMENS NEISSER.
2. Apraxia in Progressive Paralysis. M. LEWANDOWSKY.

1. *Epilepsy*.—Neisser studied 160 cases of epilepsy among which 99 cases presented at some time mental defect; these did not include the usual post-epileptic hebetude, or cases of organic brain disease with epileptiform attacks.

2. *Apraxia*.—The case history as related was that of a male, 36 years of age, marked dementia, made no spontaneous movements. Right arm in position similar to contracture, except that the hand remained opened. Right leg was slightly spastic, tendon reflexes on right larger than left. No Babinski. Skin reflexes equal on both sides. Absolute motor aphasia

and word deafness. No ocular motor disturbance. Pupils equal and reactive. Patient followed with his eyes persons passing or objects shown to him. No facial involvement, nor difficulty in chewing or swallowing. Gait was somewhat ataxic; walked only when pushed or led along. The patient died two months later after a few days of an almost comatose state. Examination of brain showed typical progressive paralysis. (Nissl.)

Of the left arm there were but three movements, that of placing the hand behind the ear, towards the mouth and above the head as if to strike. On account of the limitation of the arm movements, together with the elimination of agnosia—the patient would carry eatable materials to the mouth—Lewandowsky places his case in the class of motor apraxia, which, associated with right-sided hemiplegia and aphasia, with disturbance of taste and hearing, without facial involvement depended upon either a diffuse cortical lesion or multiple focal lesions.

This number of the "Centralblatt" contains an obituary notice of Dr. Heinrich Laer, editor of the *Allgemeine Zeitschrift für Psychiatrie*, who died August 17, 1905, at the age of 86 years.

Journal de Psychologie, Normale et Pathologique.

(Second Year, No. 5. September-October, 1905.)

1. A Psychological and Clinical Study of Echopraxia. DROMARD.
2. Kleptomania. ROGER DUPONY.
3. Stereotyped Dreams. P. MEUNIER.
4. A Case of Phobia with Delirium and an Attempt at Murder. J. CAPGRAS.

Echopraxia.—Dromard presents clinical illustrations and a psychological study of the peculiar imitative movements exhibited by the victims of tic, phrenasthenics, certain precocious demented and idiots. He believes that the psychic basis is the same; namely, *suggestibility*, for the phenomenon, when it occurs, in all of the above-named conditions.

After defining echopraxia as an impulsive or automatic imitation of the actions of another, an imitation which takes place in an immediate manner with the brusqueness and promptitude of a reflex act, he shows how in normal life such imitative movements are constantly occurring or tending to occur. They are physiological and normal up to a certain point. They are more obvious in children than in adults, because in the former there is not the same inhibitory control from the higher mind as there is in the latter. When they become abnormal and are associated with, or are evidences of, disease, they represent merely an exaggeration of the same physiological or psychophysiological phenomenon.

This psychophysiological phenomenon is thus stated by the author: There enters into every mental representation some motor elements. Particularly true is it that the mental representation of a movement performed by another is not made up of the single visual image of that movement, but is accompanied by a kinesthetic image, which kinesthetic image is in some sort an integral part of the total representation. Upon the intensity of this kinesthetic image and consequently upon the degree of its externalization depends the intensity of the representation itself. It is not surprising that in the normal state therefore there arises always in the motor centers of the observer what may be called a *mental repetition* of the movement. This mental repetition always exceeds to some extent the boundaries of mere subjectivity; as for instance, it is impossible for the greater number of individuals to possess a mental representation of a word without a corresponding movement taking place in the muscles which would naturally serve for the utterance of that word. Accidentally and in certain conditions we may observe this *latent imitative activity objectify* itself. We know that a movement that has been perceived tends to pass from the visual center to the motor center, and that if it is not executed in actuality it is because the center of voluntary ideation, which dominates the other two, exerts upon them a restraining force and tends to intercept, if one may so say, the current that binds them together. Let this center of idea-

tion become defective for any reason whatsoever and the kinesthetic suggestion will be transmitted from the visual to the motor center, which motor center will in turn respond by the automatic production of the movement. In normal subjects mental distraction and preoccupation become synonymous with inattention on the part of the superior and inhibitory faculties, thus allowing the inferior faculties to register and repeat upon their own account what they have taken in. All this is still more obvious in states of hypnotic somnambulism. It attains to its maximum exhibition both in frequency and in clearness, in various mental troubles wherein we find it united to another symptom of the same sort; namely, *echolalia*.

Suggestibility, extreme suggestibility, is the single psychic thread which Dromard thinks binds all these movements which in the weak-minded and idiotic are referred to as tics and stereotyped movements. They are all essentially of the same nature through originating out of slight modifications belonging to the respective classes of disease in which they appear. They are forms merely of echopraxia. For example, a tic is an automatic form of echopraxia, involving to some slight degree the emotions and the volition and having been originally acquired by suggestion and imitation. The tic-like movements seen in many phrenasthenics are manifestations of echopraxia provoked by suggestive imitation in one whose mental inhibition or ideational control is weak. In a greater degree the same is true of the exhibitions of echopraxia seen in dementia præcox and other forms of dementia. The stereotype of idiocy is likewise only a form of echopraxia. The presence of some degree of voluntary ideation in precocious elements and the absence of all voluntary ideation in idiots lead to the assumption of a slightly different origin for the stereotyped movements. In the former there is a want of higher control, a weakness from above, so to say; in the latter there is no higher control, no weakness, from above, but merely a low automatic exhibition on the part of a small and wretched mind. In both instances, however, excessive suggestibility is alike the immediate origin of the automatic, stereotyped movements. Echopraxia, therefore, is inherently always the same phenomenon, and under this name and conception we can group and assimilate the tics, and the stereotyped movements in many different conditions in which mental inefficiency is a prominent factor.

2. *Kleptomania*. Dupony observes that there are generally recognized two varieties of kleptomania, each of which presents an absolutely different picture. The one is an impulsive obsession kleptomania, in which the theft is done consciously, but as the result of an irresistible impulse. The victim is aware of the wrongfulness of the act, feels ashamed, and repents. When caught he weeps, blames himself, implores mercy and swears never to do it again. The other is a kleptomania that has all the traits of a mere reflex act. Here there is no obsession. The victims are not stirred emotionally nor are they in the least affected with anxiety. They are indifferent, and their doings are automatic. They are congenitally feeble-minded or rendered feeble-minded by general paresis, chronic alcoholism, senile dementia and epileptiform states. They never present the scrupulous, psychasthenic, neurotic traits merely of the obsessed kleptomaniacs. Between these two extreme varieties of the trouble are many different degrees of it. To them, however, Dupony would add a third distinct variety, combining the prominent characteristics of the other two. In this third class, he believes, are to be found the majority of the cases of kleptomania. These patients exhibit at ordinary times normal sense and volition. When confronted by an object which for one reason or another appears desirable to them, they experience an excitement of moderate intensity and agreeableness—an excitement which is nothing like that shown by the feeble-minded kleptomaniacs nor so violent as that manifested by the obsessed. They have will power to overcome their impulsive tendency and their conscience reveals to them the criminality of the act. The kleptomania of this class of patients is therefore due to *desire*, whereas in the former two classes mere desire plays no rôle.

As an illustration of this third and most common form of kleptomania, Dupony presents a long and interesting history of a case. The woman was sixty-six years of age when she first came under the care of the author, April 9, 1904. The family history was without note. For her stealings she had been arrested many times, being condemned to prison from a few months to a period as long as three years. Early in life she tended store and thus developed a taste for barter and the handling of money. Then she married a wealthy man and took great emotional delight in purchasing and paying out money. This became almost a mania with her. At length her husband met with financial reverses, lost his fortune and died. What little was left to the widow was also lost by ruinous speculation by some of her relatives. This and other troubles with her family preyed heavily upon the patient's mind.

One day when she was making some purchases in a department store she saw a thief pick up something and escape out of the store. She was surprised to see how easily it was done, and at the same time there seemed to awaken momentarily in her the old feeling of delight which she used to experience when buying things and handling money in her palmier days. Ere long she repeated the experiment of the thief, was successful in avoiding detection, experienced a feeling of keen delight which to a slight degree involved the sexual emotion, and so began her career as a kleptomaniac. Objects of wearing apparel made of silk seemed particularly to stimulate a pleasurable feeling in the sexual sphere, and in connection with this it is noted that most of her thefts were done in or near the menstrual period. Thus they were due to a fetichistic tendency, but that they were not entirely due to this tendency is shown by the fact that except when she was in the presence of desirable objects, there was no real impulse or thought of stealing. The awakening of the latent desire by present temptation seems to have been the immediate cause of the thefts. She was conscious that her acts were wrong, though at the time of doing them her excitement was so great that she was now fully alive to the situation, and even exposed herself to ready detection by carelessly carrying under her arm the stolen goods. The report of the case is too long for further abstraction, but the many details and the careful analysis of them by the author make the report well worthy of further perusal.

3. *Stereotyped Dreams*. Quoting a number of illustrative cases and following a line of psychological analysis, the author, Meunier, concludes that a stereotyped dream—that is, a dream that repeats itself regularly under given conditions—is in a direct manner a symptom that concerns mental pathology. It is the "fixed idea" of the sleeping man. Before we can assign to it, however, its pathological value we must necessarily subject it to a most minute analysis. We must distinguish whether it is the mere persistent expression of the memories of childhood or whether it is to be regarded as a manifestation of epilepsy, hysteria or some form of insanity.

4. *Case of Phobia*. Capgras reports an interesting, but not particularly novel case in which the obsession of fear of personal injury became so great that the patient attempted murder and suicide. The delirium subsided and only the delusion of persecution remained.

(Second Year. No. 6. November-December, 1905.)

1. *Methods of the Mind Readers*. L. LAURENT.
2. *The Affective Reactions and the Origin of Mental Pain*. MASSELOX.
3. *Conjunctival Emotional Erythrosis*. MANHEIMER GOMMES.

1. *The Methods of the Mind Readers*. As Chevreul, Grasset and others have clearly demonstrated, mind reading so-called, in which there is personal contact between the subject and the operator, is nothing more or less than muscle reading, if one may be allowed the expression. Laurent accepts this explanation for these cases and indicates in a most interesting way the psychological prerequisites for success in both the reader and the

one being read. There is nothing suggested, however, that has not been long well known.

The particularly original and suggestive part of Laurent's thesis is the explanation offered of those cases of so-called mind reading in which the subject and the operator are not in contact, but on the contrary, stand far apart. The author affirms that he has repeated many of the most curious and mysterious performances done by Pickmann, Cumberland and other high-grade "thought readers," and he declares that they are all open to easy and rational explanation. In these non-contact cases, vision and audition are the means by which the "thoughts" of the subject are communicated. By both temperament and training the operator becomes able to concentrate his whole attention, his entire mind, upon one particular avenue of sense. As in certain hypnoid and cataleptoid states, all distractions are eliminated by suppression, and only one or two avenues of sense are left open. In other words, these so-called mind readers merely acquire the habit of voluntarily and automatically ignoring all sights and sounds except those that they are specially desirous of catching. The least movement, the faintest whisper, become distinct and clear to them when seen and heard across a hall full of people, though to the latter, even in the immediate vicinity, they are scarcely detectable. Such a faculty, when aided by a little dexterity on the part of the assistant, will enable an operator to perform feats of distant "mind reading" that are, in appearance, all but miracles. The faculty is not so uncommon in the observation of one who has much to do with hystericals and similarly affected people. And on the other hand a little detective work done during the public exhibitions of these "mind readers" will demonstrate the dependence of the operator upon the adroit and unnoticed whisper or movement of his assistant, who is nearby and in suppressed communication with the subject.

2. *Affective Reactions and Mental Pain.* Masselon discusses the nature and cause of melancholy, distress and similarly depressed states of the mind. Melancholia is especially characterized by suffering, an affective reaction. The suffering, however, assumes an aspect that varies with the accompanying physical and mental depression. Anxiety is paroxysmal, but depression is continuous. The two should always be carefully differentiated and studied separately, as Dumas has done, for they each have their individual traits.

Passive sadness or mere depression is dependent, in fact, upon the consciousness of certain bodily disturbances and changes such as characterize the melancholic state, and in part upon the phenomena of psychic inadequacy that goes with the depression. In this way our feelings are seen to be closely bound up with our organic and psychic functions. When these are defective, a feeling of more or less incapacity takes possession of us and provokes a sense of distress and depression. This the author discusses in great detail and illustrates by well-selected cases. Mental pain or anxiety, unlike passive sadness or mere depression, is an acute mental state. It is a composite of certain simple feelings. It is a condition of consciousness which, when provoked physiologically by certain peripheral disturbances, can only exist as long as the brain perceives those disturbances. This cœnesthetic consciousness of a physiological disturbance is accompanied by a certain number of psychic representations that communicate to it its particular aspect, such as despair, disgust, remorse, restlessness, fright, terror, etc. In this way the pangs of melancholia differ from the mere attacks of distress that accompany certain organic diseases in which there is anguish, pure and simple, without any disturbing mental representations. And thus it is seen that melancholy and melancholia are real psychic aberrations, and that the victim of them must be clearly distinguished from the individual in whom certain organic troubles cause an analogous state of mind.

3. *Emotional Conjunctival Erythrosis.*—Gommes notes that Pitres and Regis subdivide blushing into the three general types—simple erythrosis; emotional erythrosis wherein there is a feeling of shame and irritability

at the fact of the blushing occurring so readily, and erythrophobia wherein the very thought of blushing constitutes a true obsession. The author reports a curious case in a man forty-two years of age (the first, he says, on record) in whom the conjunctiva of one eye became violently congested every time the patient conversed about the operation for strabismus that had been done upon that eye long before. In the discussion of the phenomena in this case the author emphasizes the following points: The simultaneous association of this vasomotor trouble in the conjunctiva with a particular group of mental representations; the appearance of this emotional vascular manifestation in a region heretofore unnoted; the etiological bearing of the old traumatism (operation) in the production of the affective and vascular phenomena; the awakening of the mental representations in connection with the ball of the eye leading to a sympathetic manifestation of the same sort in the other eye, and finally in the whole face; and lastly, the feeling of mental distress during the crises and of relief after it; or in other words, the association of the entire phenomenon of paroxysmal anxiety with the local conjunctival hyperemia.

METTLER (Chicago).

Miscellany

LOCALIZATION OF THE HIGHER PSYCHIC FUNCTIONS. C. K. Mills and T. H. Weisenberg, Philadelphia (Journal A. M. A., Feb. 3).

After first sketching briefly the history and present status of the question of cerebral localization the authors bring forward the data and reasons for the belief that the pre-frontal lobe, that is that portion of the brain anterior to the motor centres, and especially the left prefrontal lobe, is the centre of the highest psychic functions. First, they find much evidence of value in support of this view, in the studies of human and comparative morphology and anatomy. Brains of persons of known intellectual powers show a special development of this region, and if such brains are compared with those of human beings of low individual or racial development the psycho-physiologic importance of the pre-frontal region becomes more apparent. Exceptionally the left lobe has not the highest development as compared with the right, and in studying the conditions a careful comparison should be made between the gyral and fissural characteristics of the pre-frontal and parieto-temporo-occipital areas. Morphologic studies of the brains of imbeciles support the theory of the higher psychic functions of the anterior lobes, and the embryologic studies of Flechsig and the histologic researches of Campbell show, among other things, the absence of projection cells and fibers in this region of the brain. Campbell speaks of it as the very last pallium to appear in the progress of phylogenesis, which is in accordance with the view here expressed, as the highest and most specially endowed portions of the nervous system are the latest to appear. Gross and microscopic examinations of the brains of general paretics afford support to this view, and it is probable that a careful study in cases of dementia præcox will also afford like evidence. If the prefrontal lobe is the seat of the higher psychic action, the suggestion naturally occurs whether it can be subdivided into sub-areas or centres. The difficulty of answering this question is evident, but the authors suggest as a possible clue the position of certain known motor centres that are most clearly associated with psychic functions, such as those for speech and for the movements of the head and eyes, which project from the pre-central convolution into the pre-frontal lobe. They criticise the work of certain authors who have questioned the psychic function of the pre-frontal lobes, and point out their fallacies and defective methods of study. The paper concludes with the report of a case of tumor of the pre-frontal lobe bearing on the subject here discussed. The article is illustrated.

CEPHALIC TETANUS. J. H. Lloyd (Journal A. M. A., Oct. 7).

Lloyd reports a case of this rather rare variety of tetanus, in which, contrary to the usual rule, the facial paralysis was bilateral. As in all

other recorded cases of this kind, except one, the original inoculation wound was on the bridge of the nose. He reviews the chief facts of note in cephalic tetanus, and recapitulates briefly the other cases, seven in all, of facial diplegia in head tetanus that he has found in the literature. The peculiar fact that the same infection causes paralysis of one nerve while inducing tetanic spasm in others, is remarked, but can not be very well explained. Autopsy results, he states, are so far negative. The prognosis of head tetanus is a little better than in the usual type, but it is a grave disease with a very high mortality. Lloyd's patient came within the "chronic" group, the symptoms only appearing on the fourteenth day after the injury and she made a good recovery. The peculiarities of the case, it being the seventh or eighth thus far reported with diplegia, render it of special interest.

CENTRAL ATAXIA IN CHILDHOOD. A. W. Fairbanks (Journal A. M. A., Oct. 7).

The author discusses the condition occasionally observed in children characterized by muscular inco-ordination, delayed voluntary muscular action, unsteady gait, slow or hesitating speech, occasionally explosive, nystagmus, tremor, involuntary movements, choreiform or otherwise, deficient energy and later paralysis, muscular spasm and contractures. Other less characteristic symptoms are vertigo, headache, optic atrophy, pupillary anomalies, various mental and sensory symptoms, trophic changes in muscles and more rarely, sphincter weakness and cutaneous trophic changes. Some of these symptoms are later than the others, and may mask the earlier symptoms of the disease. Fairbanks thinks tendon reflex anomalies are simply a matter of duration or extent of the central lesion and not essential to the symptom complex. The variations from the original type of Friedreich are remarked, and the author refers to the cases reported by Everett Smith, Nonne, Menzel and Sanger Brown as most interesting and typical of the type here discussed. In the autopsies that have been made nearly all the subjects showed extreme degeneration of the posterior parts of the cord, and posterior nerve roots were more or less degenerated in all. In all but one case there was some atrophy of the medulla and cerebellum and atrophic changes in certain of the cranial nerves. The pathology of the condition is discussed, and he points out that the latest formed portions of the cord are the seat of greatest degeneration. He thinks that the defects indicate a process supervening on a developmental insufficiency, either of structure or inherent vitality of the nervous system. In Nonne's anomalous case there was general smallness of the entire nervous system without special signs of degeneration.

THE PSYCHOSES OF HEART DISEASE. W. House (Journal A. M. A., Oct. 28).

Dr. House calls attention the mental disturbances associated with cardiac disease, which, he thinks, have been rather neglected by authors of text books, the heart disease being regarded either as a complication of the insanity, or the organic symptoms predominating, they either overshadow the slight mental ones or so disable the patient that he can be readily cared for in the wards of a general hospital where psychic derangements are considered as only secondary and subordinate to his bodily ailment. In the severer cases this may do no harm, but in the slighter ones it is bad, as the mental disorder which should be attended to is likely to be overlooked. He recognizes four principal types, more or less shading into each other, as follows: 1. Panicky conditions alternating with some depression and irritability, without active delusions of hallucinations. In such cases the patient is usually terrified by the consciousness of cardiac sensation and irregularities. 2. Delusive symptoms based on misinterpretations of local cardiac phenomena, such as pain. 3. Active hallucinations and delusions from circulatory disturbances involving sensory organs. 4. Dementias from secondary lesions of the brain. Case histories illustrating the different types and

the relation of the heart lesions to the mental symptoms are given. It is not contended that the heart disease was the sole cause in every case, but rather that it was the exciting cause, except wherein the cardiac troubles were rather the effect, and especial emphasis is given to the relationship of mental improvement to the treatment directed to the heart trouble. During a residence of nearly two years in a large State hospital the author observed but few of these cardio-mental cases, and the inference is that they are more often treated by the internist than by the alienist, and their psychic side has thus been minimized.

DEFECTS OF WILL FROM A MEDICAL STANDPOINT. H. T. Pershing (Journal A. M. A., Oct. 28).

The author defines volition practically as the idea of motion and locates its seat in the motor centres of the brain. The transformation of a sensation of motion into a memory and into the idea of its repetition and the cerebral mechanism involved is worked out by him in detail and practical deductions are drawn. The control of acts is best obtained, not by prohibitions that arouse the idea to be avoided, but rather by displacing it by something better. In hysterical paralysis, for example, the physicians should try to raise the emotional tone, then to excite the depressed sensory centres by electricity and passive motion, and then further to awaken the lost idea of motion by encouraging the patient to aid rhythmic passive motion by voluntary effort. The fundamental thing is to reawaken the lost sensations and ideas in the kinesthetic centre. This is the main idea in his article, but he elaborates it to apply to the various neurasthenic defects of will, as well as to morbid impulses or obsessions which are to be combated, giving also in a suggestive way the general principles of treatment adapted to the several types of disordered volition. CAMP (Philadelphia).

SURGICAL TREATMENT OF INTRASPINAL TUMORS. Richard H. Harte (Annals of Surgery, October, 1905).

Harte presents an analysis of 92 cases operated for spinal tumor. This series shows a mortality of 47 per cent, but if late deaths are deducted, this is reduced to 28 per cent. The high death rate should not deter surgeons to operate, since the results are markedly beneficial. In 88 of the cases the nature of the tumor was recorded as follows: Sarcoma, 37; adhesions, 11; echinococcus, 8; fibroma, 16; syringomyelia, 5; endothelioma, 4; psammoma, 3; cyst, 3; fibromyoma, 2; osteoma, 2; tumor of vertebra, 1; myeloma, 1; lipoma, 1; lymphangioma, 1; primary carcinoma, 1; secondary carcinoma, 1; and dermoid cyst, 1. Of the 49 patients who survived the operation 59 per cent were cured, 34 per cent were improved and 6 per cent unchanged in condition. The nature of the growth is practically impossible to determine prior to operation. Sarcomata can be diagnosed with certainty only when clearly secondary. It is usually stated that extradural tumors are more frequent and much less fatal than intradural growths. In this series 50 were extradural and 36 intradural, the mortality in the former being 50 per cent and in the latter 47.21 per cent. This may be due to the fact that sarcomata are more frequently extradural. The relative mortality in males and females is 45 and 57 per cent respectively, but again this may be influenced by the greater frequency of sarcomata in the male. Of 82 cases in which the region affected is noted the upper dorsal was involved in 33, the lower dorsal in 24, the lumbosacral in 14, and the cervical in 11. Of the cases in which the cause of death was recorded fully one-half died of shock and hemorrhage, or of infection and meningitis.

COWLES (New York).

THE
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Original Articles

THE GREAT PSYCHICAL IMPORTANCE OF EAR DISEASE.*

BY W. SOHIER BRYANT, A.M., M.D.,

OF NEW YORK CITY.

My attention was called to this subject by a patient who had chronic catarrhal otitis media with tinnitus. She also had auditory hallucinations. A regular course of treatment for the ear conditions stopped both the tinnitus and the hallucinations. Since that time I have met three cases in different clinics which had much the same complaints and yielded to treatment in the same way.

My four following cases were briefly noted in *The Annals of Otology*—St. Louis, September, 1905.

Case I. The patient was a housemaid, thirty-two years of age and single. Her family history was psychopathic. I treated her at the New York Eye and Ear Infirmary in 1903. She came to the hospital for treatment and relief from auditory hallucinations which prevented her sleeping. The voices spoke chiefly about things in her mind. They said bad things about her, and were most annoying in a quiet place and in bed. At night she could not shake off the incubus of their reality and would try to run away from them.

Inspection showed otitis media catarrhalis chronica and a moderate stenosis of the Eustachian tube. She said that she had buzzing and ringing tinnitus, principally in the right ear, and that the sounds of the elevated trains remained in her head long after they had passed. She heard voices in either ear when she put it on the pillow.

*Read at the fifteenth International Medical Congress at Lisbon.

Treatment was given by the catheter and the Siglé speculum, and by application of a solution of silver nitrate. Considerable improvement followed. The hallucinations soon became entirely conscious and turned into illusions. The voices became lower and gradually unintelligible, and in two months and a half the tinnitus ceased.

Case II. I treated the patient in 1904 at the Vanderbilt Clinic, where she came for relief from the distress caused by hearing voices constantly speaking to her. People she knew across the sea spoke ill of her. Their voices were very real to her. Part of the time she was able to persuade herself that the voices were only imaginary. Occasionally she had visual hallucinations together with vivid auditory hallucinations, and saw her brothers who were far away in Ireland, while they upbraided her.

The patient was a psychopathic single woman of 31, and was not a teetotaler. Her eyes had a wild, restless expression. She was a housemaid. An examination of her ears showed a slight otitis media catarrhalis chronica and also a slight obstruction of the Eustachian tube. The mucous membrane of the naso-pharynx was congested. Treatment of the naso-pharynx and catheterization of the Eustachian tube stopped the hallucinations after a few times.

In the spring of 1905, the patient was seen by Dr. Michaelis. She had a mild recurrence of the auditory hallucinations. This time she complained of the man next door who, she said, had designs on her. Again the hallucinations soon yielded to catheterization.

Case III. I saw this patient at the Presbyterian Hospital. She was a married woman, 34 years old, and had one child. She was mildly alcoholic. Her antecedents were neurotic. Her father, brother, and child were all psychopathic. The patient heard persecuting voices and also complained of very loud tinnitus of varying character in the right ear and head. There was a history of a running ear. Inspection showed that the left membrana tympani was cicatrized. The right meatus was closed by a cicatrix just external to the isthmus of the canal. This ear had not discharged for three years. The nose was in a bad condition. It was filled with irregularities and hypertrophies.

Treatment of the nose quickly lessened the hallucinations, but the tinnitus continued. An exacerbation of the hallucinations

occurred in six weeks. The patient was then taken into a hospital and in three days the hallucinations had ceased. In five days, the tinnitus also stopped with the cessation of the congestion of the naso-pharyngeal mucous membrane which had been put in good condition.

Case IV. A patient of Dr. Michaelis was a young man and an epileptic. He had auditory hallucinations. His ears were affected by a mild tubal stenosis and by adenoids. He complained of mucous tinnitus. Treatment was given by application of nitrate of silver solution, which quickly relieved his condition, and the hallucinations promptly ceased.

Case of Rousset and Roget⁸⁴. They report on a case of insanity with suicidal tendencies and tinnitus, dependent on catarrhal conditions in the middle ear. The insanity together with the tinnitus disappeared simultaneously with relief of the catarrhal conditions. The ear difficulty was traced to contractions following cicatrization of pharyngeal syphilitic ulcerations, which interfered with the functions of one Eustachian tube. Breaking the adhesion free allowed the tube to resume its functions and the middle ear disturbance disappeared. The patient feared mental derangement due to tertiary syphilis. The dull feelings in the head caused by the middle ear catarrhal conditions were interpreted by him as the prodromata of the final syphilitic degeneration, to avoid which he sought death. He did not complain of the tinnitus.

The course of the hallucinations or insanity in the preceding cases is strikingly like that of tinnitus. The first case especially had an augmentation and diminution of the hallucination under circumstances that produced exactly the same effect on the tinnitus which was due to partial closure of the Eustachian tube from naso-pharyngeal congestion. For further description of tinnitus aurium, see my article in the *Annals of Otology, Rhinology, and Laryngology*, (St. Louis, March, 1904), and in *Transactions of the American Otological Society*, 1904,^{14 16}. The treatment followed in my cases was the same treatment described by me in *The Laryngoscope*, (St. Louis, July, 1904),¹⁵.

The good results in these cases have encouraged me to investigate the possible connection between auditory hallucinations and ear disease. The literature on this subject is practically one-sided. Apparently, otologists are indifferent to the subject. Ex-

cept by a very few authors, no attention has been given to this topic. Schwartze⁵⁰, in 1866, was the first otologist to write on this subject. Since then only a few have mentioned it.

Purulent inflammation of the middle ear and mastoid region has been noted by some authors as having, in certain cases, a direct relation to psychoses. Whether this connection is dependent on increased intracranial pressure, direct meningeal irritation, reflex nervous conditions, disturbed cerebral circulation, or toxemia, is not determined. But the fact remains that in these cases, cure of the purulent process cured the psychosis, or retention of pus aggravated the mental defect, or return of the purulent inflammation of the ear was accomplished by the return of the psychosis.

At the Manhattan State Hospital the writer recently observed a case of a young woman who post partem was attacked with an acute purulent inflammation of one middle ear with mastoid involvement at the same time a psychosis developed (undifferentiated form of depression). As the purulent affection receded, the mental condition improved. In private practice, the author has a case of a child five years old who has recurrent purulent inflammation of both tympani. If there is any retention of pus, maniacal attacks come on, during which the child makes inarticulate cries, breaks everything within reach and fights desperately with all the members of the family, including those it is most fond of at other times. These seizures are constant during the attack. Attention to the middle ear conditions and drainage of the pus relieves the cerebral irritation at once.^{2 9 12 13 24 35 58 62 72 76 79}

80 81 86 100 101 105 108.

The most important mental symptom that seems to have some direct connection with the condition of the ears is auditory hallucination. The dry forms of otitis media are the most frequent cause of tinnitus and are therefore probably more often concerned with psychosis than the purulent or exudative forms. The first published account of a case of auditory hallucination is found in Donat³⁰, 1531. Bodin¹⁰, in 1580, in his description of unilateral hallucinations of hearing, portrayed the first indication of a possible connection between the ears and auditory hallucinations, but he did not remark the significance of this phenomenon. A similar description was given by Dom. Calmet²², in 1751. He also failed to note the possible inference that

the ears might account for the unilaterality. Almost a century later, Calmeil²¹, in 1840, soon followed by Baillarger¹, in 1846, noted an association and relationship between the ears and auditory hallucinations. This relationship was made more explicit by Köppe⁴⁹, in 1867. There is considerable evidence showing an association of ear disease with auditory hallucinations.

1 2 3 4 5 11 17 18 19 20 22 23 24 25 27 29 31 33 34 43 47 49 51 56 60 65 66 70
71 75 76 77 78 87 89 90 91 92 93 94 98 100 106 107.

The writings of a number of observers show that in the majority of cases of auditory hallucinations the patients are also suffering from ear disease. In a remarkably large proportion of the cases of auditory hallucination, tinnitus aurium is noted, and a large number of the cases of auditory hallucination have disturbed aural functions of the kinds which are usually associated with tinnitus.

Unilateral hallucinations of hearing raise the question—are they not dependent upon some peculiarity of the ear on the affected side? On examination of the ears, defects are usually found on that side. Many authors have found that when ear disease is present, the unilateral auditory hallucinations are lateralized on the same side as the ear lesions.

1 2 5 7 8 10 22 23 27 32 36 38 39 41 42 46 48 49 52 53 54 56 57 60 61 64 65 66 67
68 69 70 73 74 76 77 78 89 92 95 97 99 100 102 103 104 109.

From what has gone before we have considerable evidence that auditory hallucinations are occasionally dependent on ear disease and that some of the cases may be due to the stimulation of the auditory centers by peripheral tinnitus aurium.

An unstable condition, such as hyper-sensibility of the auditory nerve centers and cortex, may favor the pathological interpretation of the stimuli given by the tinnitus aurium, and establish hallucinations of hearing. The gravity of the pathological impressions depend chiefly on the degree of psychical instability. These impressions vary from mere conscious illusions to hallucinations under the patient's control, and from hallucinations to dominant delusions.

Tinnitus may be classified as follows from a psychic point of view: (1) The largest class, in which the tinnitus is not heeded by the patient: (2) Where it is the object of mental disquiet in psychopathic patients, the tinnitus causing many nervous disturbances, as hypochondria, neurasthenia, or melancholia: (3)

Where the tinnitus causes auditory hallucinations: Group (a) hallucinations which are of slight import and are usually conscious: (b) unconscious hallucination, but of no great psychic importance: (c) true delusions, finally becoming organized.

In 1867, Köppe, associated with Von Tröltch⁴⁹, examined 100 insane patients and obtained the following results: Without symptoms pointing directly to the ear, 20—auditory hallucinations, 77—marked ear disease, 31—tinnitus aurium, 26.

Redlich and Kaufmann⁷⁵, in 1896, after examining 97 insane, gave the following figures: doubtful, not otherwise tabulated, 29—without hallucinations of hearing, 10—normal ears, 11—hallucinations of hearing, 58—abnormal ears, 57—tinnitus, 26. The cases were classified psychically, as follows: paranoia, 50—alcoholic insane, 17—dementia, 12—acute dementia and amentia, 8—melancholia, 6—various, 4.

The 17 cases of alcoholic insanity included: delirium tremens, 11—of these, there were without auditory hallucinations and with normal ears, 3—doubtful auditory hallucinations, and a retracted drum membrane, but no other evidence of ear disease, 1—marked auditory hallucinations, 7. Of the latter there were with normal ears, 1—distinct ear changes, 6. The distinct ear changes were as follows: otitis media catarrhalis chronica, 1—otitis media purulenta chronica, 2—labyrinthine affection, 1—otitis media catarrhalis chronica in one ear and purulenta in the other, 1—labyrinthine affection on one side, doubtful on the other, 1.

All the cases of acute alcoholic delirium had auditory hallucinations, 6; of these, much cerumen in both ears and otitis media chronica on one side, 1—unilateral otitis media purulenta chronica with polypi and cholesteatoma, and probably a labyrinthine affection, the other ear having a scarred drum membrane, 1—unilateral affection of the labyrinth, 1—less definite ear changes, but all with tinnitus aurium and electric over-irritability, 3.

I have examined 56 insane at the Manhattan State Hospital, with the following results: doubtful, not otherwise classified, unable to answer questions, 10—normal ears, 4—without hallucinations of hearing, 5—hallucinations of hearing, 41—abnormal ears (mostly non-suppurative), 42—tinnitus aurium, 27.

My 56 cases were classified as follows: dementia præcox, 13—paranoia, 11—paranoia and dementia præcox, 2—hebephrenia and

dementia præcox, 1—paresis, 4—katatonia and dementia præcox, 3—acute mania, 2—acute melancholia, 1—chronic melancholy, 1—mania depress, 1—dementia senilis, 4—dementia senilis and acute melancholy, 3—dementia senilis and chronic melancholy, 1—dementia senilis and chronic mania, 1—syphilis, 1—heredity, 2—smoking, 1—undetermined, 4.

A large amount of literature shows that auditory hallucinations have been caused by stimulation of the sound-perceiving apparatus ^{5 6 18 47 50 53 82 83}. The hallucinations may be excited by external sound impressions, or from primary stimulation of the auditory centers. ^{42 43 44 59 69 70 82 97}.

The hallucinations may depend for their inception on stimuli received by the auditory center. The stimuli originating peripherally pass directly along the auditory fibres, or indirectly from other centers along the association tracts. In rare cases, the auditory center itself may be subject to primary stimulation due to pressure or to chemical irritants.

The sound-perceiving apparatus is abnormally sensitive to electric stimulation and probably to other stimuli in patients suffering from auditory hallucination. ^{18 25 47 53}. This irritability is often found in the deaf also. It is perhaps due to the nervous exhaustion which follows the painful effort to hear, when hearing is difficult⁸⁷. Probably it also follows the nervous fatigue which results from constant noises, chiefly tinnitus, and general constitutional weakness. In a few cases the irritability is due to exhaustion consequent on disease of the nerve centers and the brain, as for instance, tumor, etc. Sometimes, instead of irritability, a paresis is noted under the foregoing conditions.

Though the pre-disposition to the production of hallucination is found in a psychopathic condition, an exciting cause is necessary. This has been illustrated by several authors who have produced artificial hallucinations by stimulation of the auditory apparatus^{18 47 50 63 74}.

Tinnitus aurium is a frequent accompaniment of auditory hallucination and is possibly its exciting cause sometimes. This conclusion is sustained by the number of cases having both tinnitus and hallucination, and by the remarkable number of cases of auditory hallucination associated with ear disease. Over 90% of all cases of ear disease in the psychically sound have

had tinnitus, and over 80% still have it. The percentage is much higher in catarrhal affections alone. Ear diseases in the psychically sound would therefore generally be associated with tinnitus and the same is probably the case with the insane^{1 2 5}

17 29 40 45 47 48 49 53 54 55 56 66 73 75 76 77 90 91 92 103 106 107 109.

I have found that the hallucinations fluctuated, together with the tinnitus. This has been noted by others^{5 70 91}. In these cases the hallucinations follow the course of the ear lesions—unilateral, bilateral, intermittent, and remittent, etc. Sometimes, however, it has been noted that the tinnitus alternates with the auditory hallucinations.

The auditory hallucinations which are provoked by external sounds closely resemble paracusis, or after-impression tinnitus aurium⁹¹. They may be excited by any common sound, such as a clock ticking, striking, etc.

Hallucinations of hearing have been observed which were induced by irritation of the peripheral nerves about the ears, that is, by the stimulation of the trigeminal nerve. Férè³² reports a case of reflex auditory hallucinations due to facial herpes. Tinnitus is sometimes excited in the same way.

The stimuli causing the hallucination in the cortex may arise in any peripheral region or organ (Roncoroni⁸²). This is doubtless the same reflex sensation as tinnitus excited in the same manner. Alterations in the circulation which are known to affect tinnitus sometimes, also affect hallucinations^{14 15 16 40}. The condition of the naso-pharynx, which is a very important factor in determining tinnitus, is also relevant to hallucination. The congested, inflamed mucous membrane sometimes seen in the acutely insane with auditory hallucinations, fades out to its normal appearance during convalescence from the hallucinations, and the purulent secretion often seen in the naso-pharynxes of the chronically insane, ceases as the long-standing cases of hallucination improve. Trauma of the ear has also been noted as an exciting cause of auditory hallucination^{2 34 47 75 77}. It is usually accompanied by tinnitus.

As we might expect from some of the preceding observations, ear disease is sometimes the precursor of auditory hallucinations^{1 2 5 19 40 46 56 64 66 74 77 90 91 107}. The insane whom I examined had chronic ear affections which in all the cases of recent insanity must have preceded the hallucinations of hearing.

Ear disease both renders the sound-perceiving apparatus

more impressionable and furnishes the source of the impressions, namely, tinnitus; in addition, it shuts off from the mind some of the correction and occupation it might get from external sounds which are normally heard, but which, owing to the concomitant deafness cannot now reach the auditory centers. These conditions result in a diminution of external sound-perception, together with disturbed association which is increased by the disturbances of sensation (tinnitus). (Stoddard⁹⁶.)

Absolute silence is a mental strain for a normal individual, when he chances to observe it either on the summit of a mountain, or in subterranean depths. Under these conditions the pulse sounds in the ears become audible and the mind becomes conscious of a multitude of indefinite, internal sound-sensations, much to the annoyance of the individual. These phenomena in the normal individual illustrate how tinnitus causes irritation of normal auditory centers, and the analogy for pathological conditions is obvious.

The effort of the deaf to hear and the deafness itself are both causes of hallucinations (Savage⁸⁵). Deaf people are apt to get confused between the sounds which they hear and their illusions which imperceptibly grade into each other. The mind of the deaf person explains the sounds imperfectly heard in conversation into definite sentences often absolutely irrelevant. In the same way, the patient becomes confused between the auditory illusion and the tinnitus. This confusion increases until the illusions become hallucinations. There is a conflict between the internal, fictitious sounds, or hallucinations, and the external, or real.

Prognosis.—From an otological point of view, the consideration of the above observations will indicate a bad prognosis for auditory hallucinations in proportion to the deafness. The prognosis would be good in groups (1) and (2) of the psychic classification of tinnitus, and in classes (a) and (b) of group (3). It is encouraging in some of the cases of class (c), when the ear disturbance can be wholly overcome (5). Old age is an important factor as a bad indication in prognosis for hallucinations, because of the steadily failing hearing, and the concurrent tinnitus which is often due to progressive circulatory changes ^{43 49 92}.

Unilateral tinnitus aurium does not seem to have as much psychic influence as bilateral, because of the correction by the opposite good side, and, for the same reason, unilateral auditory hallucinations rarely have very much psychic importance. Bi-

lateral hallucinations with normal, or nearly normal hearing, and with remediable ear lesions should have a good prognosis. When the hearing is much diminished, the prognosis is bad, for in these cases the psychic disturbance appears to increase progressively. Finally, the hallucinations become delusions⁴⁰.

The treatment of a few cases of hallucination by attention to ear treatment have been reported, with relief in all cases and cures in some ^{2 5 19 24 26 49 56 76 88 100 108}. In 1877, Von Tröltch¹⁰⁶ first noted the improvement of auditory hallucination on the treatment of the co-existent ear disease. These cures were chiefly in suppurative diseases of the middle ear and in trauma, besides impacted cerumen and foreign bodies in the auditory meatus. It is difficult to find any mention of the cure of hallucinations of hearing by aural treatment in non-suppurative conditions, although such cures may have occurred.

The cases of auditory hallucinations which I have reported are interesting because of their evident dependence on catarrhal conditions of the ears as shown by the cessation of the hallucinations when the aural conditions were corrected.

Conclusions.—The evidence points to some connection between ear disease and hallucinations of hearing other than mere coincidence.

It is probable that hallucinations of hearing originate in subjective ear sensations in most cases.

Cure of the coincident ear disease cures or assists the convalescence from the psychoses in a notable number of cases.

Some cases of insanity appear to be excited by ear disease and the convalescence of insane cases is delayed by the presence of ear disease.

Unilateral hallucinations of hearing are unquestionably due to unilateral ear disease.

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EAR AFFECTIONS AND MENTAL DISTURBANCES*

EMIL AMBERG, M.D.,

OF DETROIT, MICHIGAN.

CASE I. Miss A. F., 44 years, a highly intelligent patient of mine, former teacher, had ringing in her ears since she was 13 years old. She was not despondent at times, she says, but so tired out that she saw nothing to live for. About one and a half years ago she suffered from "nervous prostration." This she had also when twenty years old. There seems to have been considerable disturbance on the part of the genital organs. Two years ago she suffered from what was diagnosed as erythema nodosum. She declared to me that she would at times rather have been dead than suffer from the noises in her ear. She was kind enough to write the history about herself, from which I quote the following: ". . . At about ten have severe bilious attacks often lasting a few hours each. At twelve have severe cramps, also headaches. At thirteen hearing goes suddenly, without apparent cause, but by treatment of local physician it returns in a few months, leaving ringing, roaring, etc. Slight attack of erysipelas winters fourteen and fifteen, and quite a severe attack winter of sixteenth year. Started teaching at sixteen, though went to college again in nineteenth and twentieth year. Studied always music, etc. At eighteen fell over the first time, but did not lose consciousness. At twenty, while at college, had for about a year a peculiar time—nose bleed, dizziness, unable to sit up without holding up my head, unable to walk alone, dropping over with 'dizziness,' but otherwise apparently in perfect health. Had dyspepsia and scarlet fever, and dizziness and palpitation always towards close of school year before vacations. Ears always ringing, nose full of sores. Sleep which was poor all my life, is better for a few years after a change of climate. Noise always jarred on me; music, if not well rendered. Sympathy was scarce, for I looked well to any but experienced doctors. At 41, one day while feeling well, but during great press of work I dropped over as I had many times before. For weeks could not walk alone. Finally one experienced doctor sent me word that circumcision was necessary. This proved to be a very much needed operation. I believe now, two years since that operation, that the two troubles were the cause of a life of unrest and at times misery. Physicians were as wise as children—a tonic always eased their consciences. I believe about the most distressing part of the

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trouble was, even when otherwise feeling pretty well, my inability to walk. I walked as if intoxicated, even going off a sidewalk across a lawn.

"However, at this time many distressing features of the case have departed. My appetite is good, condition of intestines is much improved, no more heart failures since several months, almost no more eyeache (have worn glasses for two years), no more cold hands and feet and head, seldom any pain in back of head, can sleep beautifully, even though a little noise or disturbance, seldom cry, not as excitable. That combination of troubles was in existence when the menopause began, it will be easily understood that complete recovery from neurasthenia and brain fag (as my trouble was called) will be slow. I have had a rash at any time of life, especially after eating too many strawberries."

CASE 2. Miss M. G., 28 years old, consulted me first on Oct. 8, 1905. She had suffered somewhat from her ears before she met with a heavy fall on the back of her head while skating, winter before last. "The head hurt terribly, just as if it would burst." Patient went home and when she awoke next morning noticed that she was almost totally deaf. She immediately underwent treatment, but without beneficial results. There had been no vertigo. She had suffered, previous to the accident, from some noises in both ears, resembling escaping steam, but until last spring she had in the right ear a noise "like a blizzard," dating from the time of the accident. She does not remember to have suffered from dizziness at that time. Twice since, she became so hard of hearing, she heard what she terms "the most beautiful music—almost heavenly." It appeared to her as if four or five instruments were playing, also the singing of somebody with a very high voice was heard by her, but she could not understand anything. She feared that she had become insane. A physician then told her that she would lose her reason over it. After this remark of the physician, she cried every night for a time and shed "so many tears as to fill a battleship."

CASE 3. During my internship in the Aural Department of the Massachusetts Charitable Eye and Ear Infirmary in Boston, I once found a patient in the Women's Ward lying on the floor. She confessed that she attempted to end her life with laudanum on account of the intolerable noises in her ears. The patient told me that she would repeat her suicidal attempt. I heard that this patient had to be sent to an asylum later on.

CASE 4. In the November, 1904, issue of the *Physician and Surgeons*, Ann Arbor and Detroit, I mentioned, while furnishing a report of a case of mastoiditis, etc., that the patient could not give a reliable account of his disease on account of his affection.

CASE 5. A patient of mine during her convalescence after a mastoid operation expressed surprise at her mental state, in

asmuch as she had not noticed an instance concerning her which occurred previous to the mastoid operation, and which under ordinary conditions would not have escaped her attention.

CASE 6. Also during my internship I had an opportunity to see a patient with an extradural abscess, who developed a temperature of 107.2° after a chill. (Described by I. Orne Green in the *Boston Medical and Surgical Journal*.) Patient was delirious when operated upon about 8 p. m., by Dr. Green. I had to change the dressing frequently for quite a while after the operation, an area of considerable extent between the squamous portion of the temporal bone and the dura being involved. It appeared to me that the temper of the patient stood in direct relation to the quantity of pus. (Two subsequent operations became necessary; at last Dr. Green removed a large sequester of the temporal bone.)

CASE 7. A patient of mine, a boy seven years old, developed during scarlet fever, bilateral otitis media. The boy, who is of a very peaceful disposition, ordinarily, and who is very much attached to his mother, called her, to her great surprise: "Big old steamboat," "A cranky old thing," and used to members of his family expressions like: "Big old camphorated oil," "Saucy villian, I'll kill ye," "Big old Pollak," "Big old Jew," "You old nigger," "Big old calf," "Mean old thing," "You old monkey," "Nigger, nigger, never die." The boy expressed later his surprise when told what he had said during the height of his disease. Convalescence was retarded until a mastoid operation had been performed, after which the albumin in the urine disappeared. His sister, a young lady of about eighteen, just recovered from scarlet fever, stayed for a little while with relatives in whose house an aunt had died some time previously. The body at that time was laid out in the parlor. The young lady slept in this parlor and had a hallucination of vision, seeing her aunt on the bier. The relatives convinced her of the deception, and she has not been bothered since.

CASE 8. I was called some time ago by Dr. Fechheimer, City Physician, to see a middle aged woman who was suffering from what appeared to be a serious complication of a middle ear supuration. The patient was stuporous and, in my opinion, would have been unable to understand the seriousness of her condition, even if she had had the necessary medical knowledge. We impressed upon the other members of the family the absolute necessity for surgical interference. The mother was afraid of the reputation of her family if the patient would enter a hospital, on account of some peculiar reason. The patient lived in what appeared to be a disorderly house. Although I had argued with the mother and tried to convince her of the absolute futility of her objection, and at last was allowed to order the ambulance, the family did not allow the patient to be taken to the hospital. They changed physicians. Meningitis was given as the cause of death.

CASE 9. In the beginning of 1904 I treated a girl 18 years old, for an acute otitis media developing after an angina. The girl soon showed marked symptoms of mental disturbance with suicidal tendency. She was subsequently sent to an asylum. August, 1905, the superintendent of the asylum was kind enough to write to me: "... I think we may regard the case of Miss Blank one of maniac-depressive insanity. She recovered quite promptly from the depression present at the time of her admission to—Blank—. After going away I believe the pendulum swung rather to the other extreme. She visited here some months afterward and appeared a trifle elated and heavy." The family history justifies the assumption of a strong predisposition.

CASE 10. Previously referred to by me². A patient who suffered from "congenital idiocy," as diagnosed in the Wayne County Asylum, developed a mastoiditis and was operated upon by me for this affection. I was told that her mental symptoms showed a slight improvement for some time after the operation.

CASE 11. A patient suffering from terminal dementia (Wayne County Asylum) was treated by me for a large polyp in his ear. During the removal of the polyp the apparent freedom from pain was very characteristic. A change in the patient's mental condition did not occur nor was it expected to occur.

While the number of cases is small, and while the description is rather incomplete, the deductions which can be drawn in connection with the observations of others furnish a little addition to a chapter in medicine which is of great importance from a clinical as well as from a forensic point of view.

These eleven cases can be divided into four classes:

Class I (1-3) comprises cases of a chronic disturbance in which the disturbance of the function of the ear is most prevalent.

Class II (4-8) represents cases in which a suppuration existed with either a general toxemia or a local irritation.

Class III (case 9) represents a case of suppuration in which it cannot be stated with certainty whether the mental disturbance was only an exacerbation of an existing affection of the mind or whether the toxemia caused the disturbance.

Class IV (cases 10 and 11) represents patients with a pronounced mental disturbance who suffered from affections of the ear and in whom a connection between the two is not apparent.

Besides these four classes there exists a fifth one:

Class V in which an accumulation of cerumen (Politzer, p. 144) can cause mental depression (Roosa) and hallucinations. (Rohrer.)

The interesting relation of the various anomalies of the auricle to insane people and criminals is not discussed in this paper, nor the pathologic conditions pertaining to them. I only quote from Moos³ as follows: "Vali examined 500 healthy men and 500 healthy women, furthermore, 397 mentally diseased persons (216 men, 181 women), and 90 idiots. Result: In normal healthy people, 26 per cent., of the men and 15 per cent., of the women do not possess a normal auricle; only one-half of the mentally diseased and idiots possess a normal auricle."

Class I (cases 1, 2, 3) shows a predominating symptom the tinnitus aurium. Case (1) and case (3) are different from case (2) inasmuch as a simple tinnitus caused one patient to wish death, the second to try to end the life, while case (2) experienced pleasant sensations. Case 1 is in my opinion, a neurasthenic patient. I should not like to decide whether the ear caused the neurasthenia or whether ear disturbance is only accidental. In regard to the mental condition of patient 3, aside from the suicidal attempt I cannot say anything. Case 2 does not show any discernible mental disturbance. The symptoms presented by this patient, however, are of great interest because we have before us auditory hallucinations. This phenomenon is of so great importance that a few words about it may not be out of place.

Urbantschitsch⁴ says: "Auditory hallucinations are essentially based on an irritation of the cortex and are frequently found in insane people. They are different from tinnitus inasmuch as the voices of men or animals are heard, or words, sentences, phrases, in delusions of being persecuted, of abusive talks with which the patient usually combines a really speaking person. Also mentally normal people who are hard of hearing imagine sometimes they hear words, they imagine that somebody talks to them, etc., but this is mostly based upon a deception of judgment and not on auditory hallucinations, although such hallucinations may occur also in people who are otherwise of a healthy mind. Of importance is the influence of the various affections of the organ of hearing

upon auditory hallucinations. Experience teaches us that all those causes which create subjective auditory sensations in people with a healthy mind can set free auditory hallucinations in persons inclined to the same."

It would seem that we have to deal with three kinds of noises in relation to the ear, in so far as their origin is concerned: 1. Entotic. 2. Subjective. 3. Objective noises. Entotic noises, according to Urbantschitsch, are auditory sensations which are set free by a source of noise within the body. This source of noise is usually located in the organ of hearing or in the surrounding parts. Subjective noises, in my opinion, are those which are created by an irritation of the cortex of the brain; whereas objective noises are those created in the outer world.

W. Sohier Bryant⁵ classifies tinnitus aurium as follows: Tinnitus:

I. Objective—(A) Vibratory: 1. External, (a) Vascular, (b) Pharyngeal, (c) Respiratory, (d) Muscular; 2 Internal; (a) Salpingeal, (b) Tympanic.

II. Subjective—(A) Phonetic: 1 Exaural, (a) Vital, (b) diplacusic; 2 Endotic, (a) Circulatory, (b) Myotilitic, (c) Movement, (d) Somatic. (B) Neurotic: 1 Peripheral, (a) Reflex; 2 Otic, (a) Conduction. I Laryngeal. II Tubal. III Ossicular. IV Mucous. V Contraction. VI Adhesion. VII Fenestral. VIII Traumatic. IX Meatal, (b) Reaction: 3 Sensory: (a) Nerve tinnitus. I Peripheral. II Trunk. III Proximal. IV Associated, (b) Psychopathic. I Central. II Illusional. III Hallucinational. IV Delusional.

In regard to the psychopathic tinnitus Bryant says: "(b) Psychopathic tinnitus may be present in absolute deafness or with perfect hearing. The subjective sensations are musical tones or voices." * * * * "Both ears are usually similarly affected, but it is sometimes unilateral and occasionally the sounds in the two ears have constant but different characteristics."

Dr. Bryant was kind enough to give me the following explanation (by letter).

1. Central tinnitus which has its origin in the auditory centers.

2. Delusional tinnitus caused by subjective sounds which

the patient firmly believes have an unnatural origin and import. They are of profound psychological importance because the patient cannot recognize their subjective origin.

3. Hallucinational tinnitus, where the patient hears sounds which he recognizes definitely as actual sounds, but at the same time he is able to recognize their subjective origin and that they have no basis in fact. They are, however, of considerable psychological importance.

4. Illusional tinnitus, where the tinnitus sounds like actual sounds but the patient readily perceives their subjective origin. This is of no psychological importance.

Bryant^{6 7} contributes valuable suggestions to the subject under consideration. He says, in part: "(The treatment of tinnitus aurium): In (b) psychopathic tinnitus, when dependent on operable pathological changes, an improvement may follow local treatment of these intracranial conditions. (1) Inflammations should be treated locally with antiphlogistic remedies, and the products of inflammation removed by drainage. (2) New growths are removed by surgical means. (3) Pressure from within or from without is relieved by surgical means, as in a depressed fracture or abscess." Bryant recommends the section of the auditory nerve, when hearing by bone conduction is unimpaired, and when all treatment has been tried and failed, in cases of pure tinnitus.

V. Hofmann⁸ says: "We speak of hallucinations when no external impression of the sense takes place, when the perception is created in the brain itself, whereas we speak of illusion when outer impressions of our senses are very falsely perceived and interpreted. Most frequent are deceptions of the sense of sight, spectres, demons, figures of various kinds, menacing or jeering gestures, etc., and of the hearing (voices), not infrequently those of taste and smell." Kraepelin states (Text-book, 1896, p. 99) that in a given case the separation is frequently very difficult or entirely impossible.

Gradenigo⁹ says: "In mentally predisposed people auditory hallucinations and deceptions of hearing are frequently caused by sometimes only insignificant changes of the organ of hearing. Koeppé and Schwartze have found that hallucinations and deceptions of hearing were not absent in any of those insane in whom the organ of hearing was affected. Lannois made a study of

the organ of hearing of 45 insane. In 19 the acuteness of hearing was diminished and in 15 of those hallucinations were present. In other cases the patients hear musical tones, melodies, songs, romances (Brunner, Kessel, Gelle). One of my patients who only recently left the insane asylum, where he had been on account of grave brain symptoms, heard constantly a known melody besides objective noises of a deep pitch. There existed a stenosis of the Eustachian tube on one side with a slight decrease of hearing and autophony. The inner ear was healthy. Politzer's air douche, only once applied, made the phenomenon disappear. The treatment of the frequently only insignificant peripheric affection which can easily be cured, is usually sufficient in such cases of alterations and deceptions of hearing to make the mental symptoms disappear. When one considers that these favor the creation of true psychoses in predisposed people, one can easily understand that a thorough examination of the organ of hearing is necessary with some patients."

Wm. Sohler Bryant¹⁰ says, in part: "There is considerable evidence showing the association of ear disease with auditory hallucinations. The results given by a number of observers show that in the majority of cases of auditory hallucinations, the patients are also suffering from ear disease. In many of the hallucination cases, complaint of tinnitus is also found; in fact, very few cases of auditory hallucination are free from disturbed aural function of the kinds which are usually accompanied by tinnitus.

"Unilaterality of some hallucinations of hearing suggest that they may possibly depend upon a peculiarity of the ear on the affected side. On examination of the ears, defects are found on this side.

"We have, therefore, good evidence that auditory hallucinations are often dependent upon ear disease and that some of the cases are due to stimulation of the auditory centers by peripheral tinnitus aurium.

"They vary from mere conscious illusions to hallucinations under the patient's control, from hallucinations to dominant delusions.

"The psychic classification of tinnitus is as follows: I. The largest class, in which the tinnitus is not heeded by the patient. II. When it is the object of mental disquiet in psychopathic

patients, tinnitus causes many nervous disturbances, as hypochondria, neurasthenia or melancholia and quasi insanity. III. In this class the tinnitus causes auditory hallucinations, group (a) hallucinations which are of slight import and are usually conscious, (b) unconscious hallucinations but of no great psychic importance, (c) true delusion, usually with persistent delirium, which finally becomes organized." Bryant continues:

"I quote Redlich and Kaufmann's figures. The results are as follows: Number of insane examined, 97; number of patients without hallucinations of hearing, 10; patients with normal ears, 11; hallucinations of hearing, 58; abnormal ears, 57; tinnitus, 26 cases; doubtful cases, not otherwise tabulated, 29.

"I have examined 56 insane at the Manhattan State Hospital, with the following results: Without hallucinations of hearing, 5; cases with normal ears, 4; with hallucinations of hearing, 41; cases with abnormal ears, 42 (mostly non-suppurative); cases with tinnitus aurium, 27; doubtful cases, unable to answer questions, 10.

"The hallucinations usually depend for their inception upon stimuli received by the auditory center. The stimuli originate peripherally and pass directly along the auditory fibers, or indirectly from other centers along the association tracts. In rare cases the auditory center itself may be subject to primary stimulation, which is due to pressure or to chemical irritants.

"A few cures of hallucination by ear treatments have been reported. These cures were chiefly in suppurative diseases of the middle ear and in trauma, besides impacted cerumen and foreign bodies in the meatus.

"Conclusions: The evidence points out a logical connection between ear diseases and hallucinations of hearing.

"In a susceptible, psychopathic individual, hallucinations may be excited by the irritation of subjective noises.

"Improvement or cure of the coincident ear affection may logically be expected to cause an improvement or cure of the auditory hallucination."

Hoche¹¹ says: "The ear takes the first place among the organs of sense in so far as the frequency of the delusions of senses are concerned. The more elementary delusions like buzzing, knocking, ringing of bells, etc., stand far back in regard to number and importance when compared with the organized delusions of

hearing, the hearing of words or voices. One thinks usually of these when one speaks of hallucinations of hearing." He mentions that the content of the voices not only, but also the form of the same, must be distinguished. He mentions the "imperative voices." From Cramer *Gerichtliche Psychiatric* he quotes the following example: "The wife of a working man, 32 years old, heredity normal, enters on the sixth day of her fifth confinement, which was accompanied by great loss of blood, into a condition in which the whole surroundings appear to her changed like a riddle. Voices appear which become always stronger. 'You must cut the throat of the children, cut the throat of the children, like of the chickens.' The voices become more powerful. At last they take entire possession of her so that she can no longer resist, and, with a large kitchen knife, she cuts the throats of three children, of whom she had so far been the loving mother." The relation between the physical condition here spoken of and disturbances in the inner ear make this case doubly interesting to the aurist.

Ostmann¹² is of the opinion that always a brain disposed to abnormal function, or a congenital or acquired disposition for a mental disease must be present if the peripheric irritation emanating from the ear shall produce the complex of symptoms of a psychosis. "Descendence from a family with mental diseases or convulsions (*Krampf Krankheiten*), defects of intelligence of various degrees down to idiocy, give the congenital foundation, besides other signs of degeneration like malformations of the skull. Youth, and especially old age, great losses of blood, insufficient food, confinements rapidly following each other, and long lasting disease predispose temporarily by exhaustion. If the temporary disposition is added to the congenital one the secondary psychosis can be set free especially easily."

In connection herewith the peculiar phenomenon called "double thinking," must be mentioned.

Kraepelin¹³ says: "An interesting explanation is furnished for the understanding of deceptions of senses by a peculiar disturbance which has been called 'double thinking.' It consists essentially of a 'becoming loud' of the thoughts of the patient. The nascent idea is immediately followed by a plain auditory sensation of the word thought of. Most frequently this co-hallucination occurs while reading, a little less while writing, as can be seen

then, when a speech idea penetrates with a certain strength into consciousness. Low or loud pronunciation of the words makes the hallucinatory after-sounds as a rule disappear. Besides these, other hallucinations of hearing always exist. On account of the hallucinations we must assume an increased irritability of the central plane of sense, etc."

X. Ungern-Sternberg¹⁴, in a very interesting dissertation, treats the question exhaustively, reporting five cases. He comes to the following conclusion, which is important from the standpoint of prognosis: "That form of paranoia in which the symptoms of becoming loud of thoughts prevail must be differentiated from that which takes its course without the essential delusion and which requires a relatively long time for the formation of a system on a combinatory basis; on the other hand, it must be differentiated from that form in which primary hallucinations prevail which lead quickly to dulness. I should like to see as difference that relatively quick formation of a system which is, perhaps, less logically supported, compared with the combinatory form, but which is nevertheless deeply rooted, mostly held by the mystic effect of this symptom."

(To be continued.)

THE QUESTION OF PROTOPATHIC AND EPICRITIC SENSIBILITY AND THE DISTRIBUTION OF THE TRIGEMINUS NERVE (THIRD BRANCH).

BY CHARLES L. DANA, M.D.,

OF NEW YORK.

In the summer number of *Brain*, 1905, Drs. Henry Head, W. H. R. Rivers and Joseph Sherren, publish a monograph, entitled "The Afferent Nervous System from a New Aspect." The work is a most elaborate and painstaking one, amounting practically to a volume, and I cannot attempt here either to summarize or criticise it with any completeness. Briefly, the contention is that the afferent nervous system is composed of three different systems, which conduct to the brain different forms of sensibility.

1. A protopathic system of the skin which consists of afferent fibres running, as I understand, in connection with the sympathetic and the vessels, and supplying the skin with a low degree of sensibility. This is called the somatic part of the protopathic system. There is a visceral part of the protopathic system, which supplies a low degree of sensibility to the viscera. This is identical with the sensory fibers of the sympathetic.

2. A protopathic system which consists of a set of fibers that supply the sense of movement, of deep pressure and appreciation of position, of muscles, tendons and joints. These fibers are connected with the Paccinian bodies, and they run in the motor nerves.

The "protopathic system," then as a whole, consists of fibers of sensibility which supply the skin, the viscera, and all parts of the body, inside and out. It furnishes a low degree of sensibility to the viscera and to the skin, and a special "deep" kind of sensibility to the muscles, joints and tendons. This system enables one to appreciate a sense of pain, and temperature, and location, and position, though not to a very delicate extent.

3. There is another system of afferent fibers which supply the skin alone, a purely cutaneous system, and this is called *epicritic*. This epicritic sensibility enables us to appreciate light touch, the

points of the compass, localization, and minor degrees of temperature, ranging between 22° and 40° C.

Both systems seem to be able to appreciate the sense of pain, but the epicritic sensibility furnishes a more delicate and localized appreciation. Protopathic fibers carry sensations which are badly localized, widely diffused, and sometimes referred to other parts than that of the stimulation. The protopathic fibers are incapable of appreciating light touch, and minor degrees of heat and cold, and pain appreciation is a diffuse tingling and thrilling sensation.

The material upon which this theory is based, consists of a large number of very carefully studied cases of injuries of the peripheral nerves of the limbs; also of two cases of loss of sensation by division of posterior roots. No studies have been made, apparently, of the very striking cases of section by the surgeon of the trigeminal nerve. In fact, I can find no reference of the application of the theory to the trigeminus. The authors state, however, that "the whole body, within and without," is supplied by the protopathic system, and that one set of fibers of this system—those which go to the skin—is identical with the afferent fibers of the sympathetic in the viscera. Another set, which is connected with the deep sensibility, runs in conjunction with the motor nerves. If this be the case for the trigeminal nerve, then it would seem that a clean-cut section of this nerve, such as is made by surgeons, should destroy all the epicritic sensibility, but would leave some, at least, of the protopathic sensibility, that is, an appreciation of movement, of position, of deep pressure, and perhaps some degree of appreciation of extremes of temperature and pain.

The following case has interested me in connection with this theory, and also because of its showing the rather unique distribution of the inferior branch of the trigeminal nerve. So far as it goes, it seems to show that every form of sensibility which it is possible to test, is lost when the nerve is cut close at the ganglion.

My tests were made on four consecutive occasions, with the greatest possible care, and upon a man of great intelligence, who coöperated with me in the examination. So that, however true the views may be as to the differentiation of afferent nerves into two kinds, as applied to the body and limbs, it does not seem to apply to the head. A very careful examination made of the

sensory condition in a complete paralysis of the seventh nerve, has shown also that with the paralysis of this nerve, there is no loss of the deep sensibility or sense of position.

In a case of major hysteria, with anesthesia of the trigeminus, there was an absolute loss of all forms of sensibility, both deep and superficial, and while this case does not prove anything, it would seem rather natural to suppose, that if there is a differentiation of sensibility into two types, they would be unmasked somewhat, in anesthesia due to a mental state, especially as the epicritic sensibility is apparently one of later development.

In cases of disease of the medulla and pons, in which there is often a very striking differentiation of sensibility, so that temperature, and pain, and touch are differently appreciated. the loss of the sense of temperature, for example, may be absolute, showing that, at least, in the central parts of the nervous system, the paths for the conduction of temperature sensations, are paths which conduct all degrees of sensation, whether mild or severe, whether very hot or only slightly warm.

In my examinations of cases of anesthesia from cerebral hemorrhage, involving more or less the posterior segment of the internal capsule, the changes in the sensibility are not in accordance with the division established by the authors of the monograph referred to. So that it would seem, at least, that if there is a differentiation of the two kinds of sensibility, it is confined to the specific arrangement of the spinal nerves, while the central nervous system and cranial nerves conduct the sensations in a different way.

Care of Section of the Lower, Third Branch of the Trigeminus.

Isolated lesions of the third branch of the fifth nerve are, I believe, rather rare. I know of no case (though I have not gone over all of Cushing's), in which so clean cut an isolation has been obtained as in that which I shall now report. It has an interest from two points of view: First, that of the sensory distribution of the third branch, and, Second, that of the question of the differentiation of sensations into "protopathic" and "epicritic."

The patient, upon whom the following tests were made, was a man of 64 years of age, who had suffered for five years from an inveterate tic douloureux, involving only the inferior branch. The pain began at the mental foramen; it then went to the tongue and from there shot back to the ear. Under a treatment of rest, with massive doses of strychnia, all the

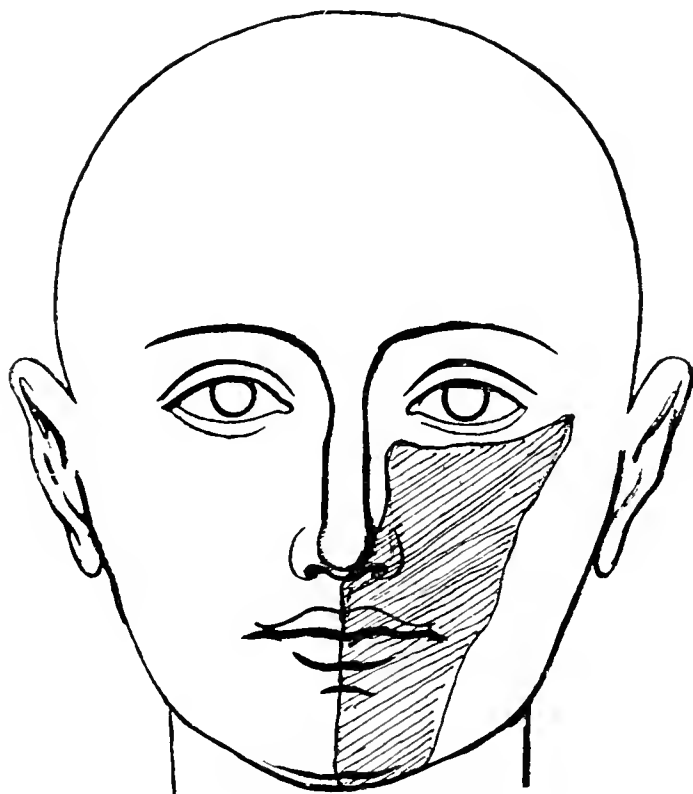
shooting pains nearly ceased, but he was left with a persistent pain and soreness at the base of the left side of the tongue. This hyperesthesia was so distressing that it made talking and chewing very uncomfortable, and gave him little peace, even when he was perfectly still.

It was therefore determined to operate, and Dr. Robert Abbé performed the operation which he uses for these cases. The cranium was trephined and the opening enlarged with a rongeur, the dura mater peeled up from the bottom of the skull until the third branch of the trigeminus was seen issuing from the dura. It was cut cleanly off (a fact corroborated by Dr. W. S. Schley, who was present and assisted at the operation), without the involvement of any other branch, and the foramen plugged with rubber tissue. The patient made an excellent recovery, and was from the first, free of his soreness and pain. Three days, five days, seven days and eleven days after the operation, I made a series of tests, to determine the distribution and character of the anaesthesia which resulted. I found a total anesthesia of the chin, just below and extending a little externally to the mouth. Also, an area of anaesthesia involving the upper lip and a portion of the inside of the nose and cheek, radiating towards the ear about half way and within about an inch of the eyelid. There was also anesthesia on the mucous membrane of the mouth and tongue. This involved the whole inner surface of the mouth and left side, including the gums of the lower and upper jaws and the palate, to the median line, and extending back as far as the edge of the soft palate. It involved the tongue, reaching as far back as its base. This area was tested by cotton and the light stroke of a camel's hair brush, by the pricking of a pin, by pinching, by squeezing the parts, by the application of ice water in a tube, and of very hot water, and it was also tested for the sense of position and deep muscular sensibility, so far as was practicable.

The patient showed an absolute loss of all these forms of sensibility to touch, pain, temperature, deep pressure and movement of the parts. With my one finger in the mouth and the other outside, a pressure between thumb and finger caused no sensation, no matter how severe the pressure. A pin driven through the cheek caused no sensation whatever, and by various repeated tests, running over the various areas, for nearly an hour, I was able to convince myself that there was absolutely no form of sensation present in the areas indicated. However, it was easily seen how one could be deceived in such an examination, for if the needle or any hard substance was touched upon the chin, so as to produce a little pressure thrown upon the hard parts below, he appreciated the fact that something was being done to him there. He could also guess at their being some irritation if the cheek were moved or stretched in any way by the

stimulus, so that, unless the tests were applied very carefully, he could, through recognition of pressure on the hard parts below, or stretching of the neighboring sensitive parts, appreciate the fact of there being some sort of sensibility there.

The area of sensibility made out for the third branch, is different, as will be seen, from that usually given in cuts.



Showing the Area of Disturbed Sensation in Case I.

At the last examination 11 days after the operation the area of anesthesia was the same. Tests applied to the ear and meatus showed no anesthesia. The patient could not tell whether the left angle of his mouth was stretched and the mouth open or not. He could draw his mouth to the left in varying degrees but not evenly or accurately, and he overdid it when told to pull his mouth to the left. In other words he had anesthesia of deep sensibility.

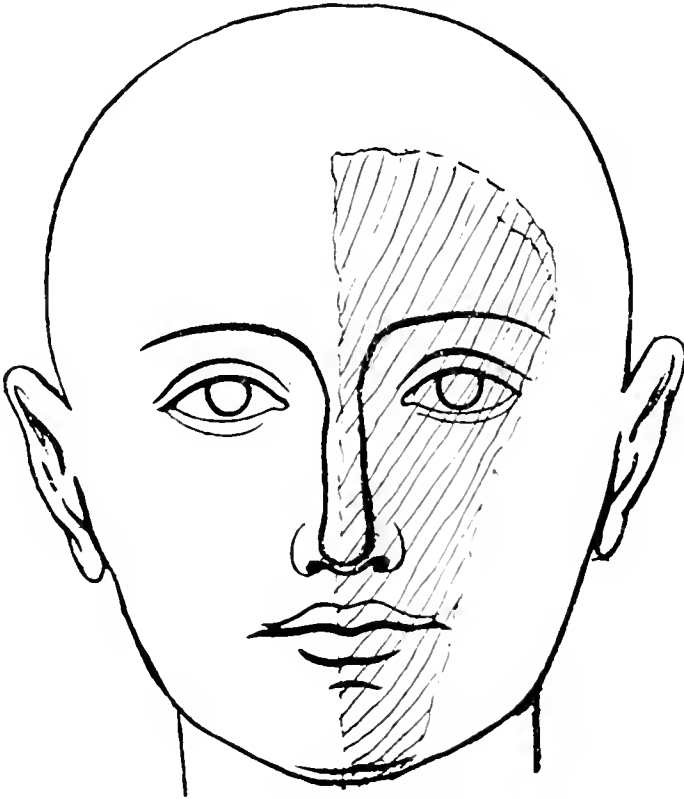
Needles thrust into the gums of both upper and lower jaw caused no sensation, (anesthesia of periosteum).

Two months later the patient is still feeling well in health, but he writes that the "numbness" of his cheek and mouth are the same.

COMPLETE LOCAL ANAESTHESIA IN A CASE OF HYSTERIA MAJOR.

A case of major hysteria in a male shows a somewhat similar condition of almost complete loss of sensation over part of the area supplied by the trigeminus.

The patient, a man aged 40, a mechanic, after a long period of hard, responsible work, received a shock by seeing someone injured. A few hours later without especial cause he felt a shock go through his left side and he fell down unconscious. I saw him two months later. He then had a left partial hemiplegia involving only arm and leg, with some lessening of the deep reflexes on that side, no clonus, no "Babinski." He had a complete left-sided anesthesia to touch, pain, temperature and deep sensibility. He had concentric limitation of visual field of left eye, bone deafness of left ear, loss of taste and smell of left side.



Showing the Area of Disturbed Sensation in Case 2.

A week later the hemiplegia had improved, the cutaneous anesthesia had gone except on the face. The visual and auditory conditions were not changed.

I examined his trigeminal anesthesia at this time on two occasions. He had absolute loss of sensation to light touch and to heavy touch, loss of localization, loss of sense of both heat and cold even to very hot or cold (ice) objects. Very heavy pressure seemed to be felt. There seemed to be appreciation of the prick of a pin as a pressure not as pain. The limitations were quite sharp, and there was corneal anesthesia.

Two months later this anesthesia had also disappeared but he had still some limitation of the visual field. Otherwise he was nearly well except for headache, nervousness, hysteria, tremor and inability to concentrate and do mental physical work.

SOCIETY PROCEEDINGS

AMERICAN NEUROLOGICAL ASSOCIATION.

Thirty-Second Annual Meeting, Held at Boston, June 4 and 5, 1906.

The President, DR. HENRY R. STEDMAN, in the Chair.

Presidential Address: The Public Obligations of the Neurologist.—By Dr. Henry R. Stedman (See this Journal, p. 489).

Spinal Cord Tumor Simulating Acute Myelitis, Associated with Optic Neuritis and Painless Labor.—By Dr. E. W. Taylor, of Boston.

The following case is reported because of its unusual character, its rapid course, the difficulties of diagnosis and the complete explanation of the obscure signs and symptoms by autopsy.

The patient, twenty-four years old, married, was taken ill Sept. 25, 1905, with pain radiating down both legs. She was at the time pregnant. The pain continued essentially unchanged for two months, obliging her to lie in a semi-erect position. Neuritis was diagnosticated. In December there was increasing pain in back and legs, much constipation and discomfort in the region of the bladder, accompanied by restlessness. She became irrational at night, and toward the end of December there was relatively sudden loss of power in the legs and feet so that there was difficulty in standing. The patient was first seen by Dr. Taylor Dec. 26. She had had hallucinations of sight and hearing, and occasionally loss of sight and place. She was not depressed. Her mental state was in general flighty. Sensation in the legs was only slightly affected. The motor weakness, however, was so great that but slight movement was possible. The knee jerks were absent and the other leg reflexes were also not obtained. Apart from the mental disturbances there was nothing whatever to direct attention elsewhere than to the lower spinal cord. Shortly thereafter complete paralysis of motion and sensation of the legs, together with absolute loss of sphincter control, supervened. The patient presented a typical picture of transverse myelitis of the lumbar cord. Symptoms of pain were subordinated in the clinical picture to the evidence of complete transverse lesion. Beyond a low specific gravity, the urine presented no important abnormality. From this time on the condition of the lower extremities remained absolutely unchanged, and there was no sign whatever of cranial nerve palsies or of disturbances in the arms or upper body, except complaints of pain, which there seemed evidence to suppose were exaggerated. A healthy child was born Jan. 13, absolutely without pain. The uterine contractions were lacking in force and the child was instrumentally delivered. Recovery from labor was entirely uneventful, and it was in general a mere incident in the course of the evident serious underlying condition. During this period disturbance of vision occurred, explained by a high degree of optic neuritis. Complete blindness supervened with the pupils fixed and dilated. Beyond a very slight palsy of one of the ocular nerves, and a transient disturbance in one facial nerve, there were no other signs of cranial disease. The symptoms of mental disturbance, occipital pain and somewhat vague headache persisted. She became increasingly apathetic, exceedingly emaciated, but at no time wholly unconscious. Death occurred under these conditions March 25.

Autopsy.—The post-mortem examination a few hours after death

showed the following conditions: Internal organs, other than brain and cord, normal. Occupying and destroying the whole lumbar enlargement, together with the fibers of the cauda equina, was a new growth made up of small round cells. There was no evidence of fiber formation, and the tumor is, therefore, to be classed as sarcoma. Extending upward from the point of complete destruction the tumor extended into the cervical region, lying on and infiltrating to a certain extent, the dorsal portion of the cord throughout practically its entire length. Dorsal nerve roots were involved in this growth, and the ventral nerve roots above the point of complete destruction were entirely spared. Secondary degenerations of dorsal tracts and of the cerebellar and Gowers' tracts were well marked. The brain showed an excessive degree of internal hydrocephalus, but was otherwise normal. The optic chiasm was directly pressed upon, as would naturally be the case, by the excess of cerebrospinal fluid.

On the clinical side the case deceived all who saw it. The points in the history to which special attention should be drawn are: Pain, which was wrongly interpreted; the relative sudden onset of a complete transverse lesion of the spinal cord; the existence of pregnancy, which was thought to be a possible cause of the pain; the onset of double optic neuritis of high degree, and the mental disturbances of the last three months of the illness. The two features of the case which predominated were the pregnancy and the myelitis. The cranial symptoms were not understood.

The autopsy completely explained the symptoms as observed during life. The initial pain in the legs was due to the beginning tumor involving the cauda equina. The persistence and increase of this symptom were due, not to the pressure of the pregnant uterus, but to the extension upward of the tumor. The myelitis was occasioned by the complete invasion of the lower portion of the cord by the rapidly growing tumor. The subsequent symptoms of increasing discomfort of a sensory sort find their explanation in the dorsal extension upward of the new growth. The hydrocephalus was undoubtedly caused through the blocking up of the vertebral canal by the tumor and a consequent failure to drain off the ventricular fluid. The result of the hydrocephalus was mental disorder of somewhat complicated character and optic neuritis through pressure. Death from general inanition.

Dr. B. Sachs was much interested in the association of symptoms that pointed to a lesion higher up in the cord. He had a case under his observation in the hospital which was in many respects similar to the one which Dr. Taylor reported. It was a woman who developed a transient attack of hemiplegia a year or more ago. She recovered completely from that, but during the last few months had developed paralysis of the lower extremities. This patient has a very slight but definite double optic neuritis, and has another symptom which is very striking; with complete loss of reflexes of the lower extremities she has a most marked increase of all the reflexes of the upper extremities. The only way Dr. Sachs had been able to explain it is that the tumor had caused a blocking of the spinal fluid, and in that way causes a greater pressure on the cervical spinal cord. He had never seen this condition before. A most careful examination of the case has excluded multiple sclerosis and other organic disease.

He was pleased to know that the diagnosis of transverse myelitis during pregnancy had been carefully considered. The fact that the symptoms were at no time unilateral made it unusually difficult to establish the diagnosis of spinal tumor.

Dr. F. X. Dercum said the case illustrated the difficulty of making an accurate diagnosis. Indeed, the diagnosis of acute myelitis was in every way justified. It is unnecessary to assume special causes for the symptoms above the level of the tumor, and for the optic neuritis, as these were in all probability due to the toxins present in such a case.

Dr. Joseph Collins asked whether a lumbar puncture was made in the case, and what information, if any, was obtained from examination of

the cerebrospinal fluid, and also what the examinations for anesthesia showed. It seemed to Dr. Collins that the paper showed; first, that the diagnosis of hysteria should never be made in the absence of the objective accompaniment of hysteria, no matter how much the nurse or the patient exaggerates the symptoms. The second point is that the presence of double sciatica in the absence of double flat foot should always make us think of lesion of the spinal cord. The existence of optic neuritis with a tumor of the spinal cord was discussed in Dr. Collins' presidential address to this association in 1902.

Dr. William G. Spiller said he had recently seen in consultation in Philadelphia two cases of tumor of the spinal cord which were very interesting. He understood Dr. Taylor to say that there was pain in the lower limbs. In the cases Dr. Spiller referred to the diagnosis of tumor was made from the symptoms. In one case an operation was performed, but in the other case, seen with Dr. Martin, operation was declined. In both of these cases severe pain of both lower limbs was a prominent symptom.

Dr. Spiller emphasized the fact that double sciatica is very often indicative of tumor of the cord or lower vertebræ. He saw a case a few years ago where the pain was in the upper limbs, and the tumor was upon the pons and grew through the foramen magnum downward upon the cord.

Mr. Hutchinson, one of the third-year medical students at the University of Pennsylvania, has reported a case recently in which syringomyelia and pachymeningitis of the thoracic cord caused obstruction to the cerebrospinal fluid and were associated with internal hydrocephalus and optic neuritis.

The symptoms in these cases of spinal tumor are often unilateral, but not always.

Dr. Herman H. Hoppe said that sometime ago he had a case under observation which rapidly developed a very acute ataxia of the lower extremities. This case also occurred during the course of a pregnancy.

There was a bilateral paralytic pupil, no response whatever to light, convergence and accommodation. The left pupil was larger than the right. The upper extremities were normal. There was a loss of patellar reflexes, marked Romberg and marked ataxia of both legs, but no loss of muscular power and no loss of sensation anywhere.

Dr. Hoppe looked upon it as probably a syphilitic case, although absolutely no history of syphilis could be obtained. Much to his surprise, after two or three months, there developed an optic neuritis. At this time she suffered violent headaches, which continued for weeks. She has improved under the iodide of potassium, and was delivered of a normal child at term, after a painful labor. Dr. Hoppe had since considered the case as probably one of acquired internal hydrocephalus.

Dr. Henry Hun said it hardly seemed to him that the internal hydrocephalus in this case could be explained by the blocking up of the fluid of the cord if the foramen of Magendie is not occluded. There is question whether there may not be another cause for the involvement of ocular nerves in such cases. He had seen a case occurring in the first pregnancy which showed both a ptosis and double vision. The patient has remained about the same, during the past twenty years, the symptoms continuing stationary. The ocular symptoms, the ptosis and double vision, have disappeared, but the paralysis has remained, and she has to wear braces. Large doses of nitrate of silver had been given her.

Of course, one would suspect syphilis in such cases, but if syphilis can be excluded in Dr. Taylor's case, he thought it could be here. As far as he knew it has been excluded. Iodide of potassium as well as mercury were given her without any improvement whatever. She had a spinal lesion, but whether it was a tumor which came to the stationary period, or a transverse myelitis, is unknown. She certainly had a painless labor.

Dr. E. W. Taylor said the discussion had been of interest to him in calling attention to certain points which in the hurry of presentation he

was not able to discuss in detail. What has been said by Dr. Spiller and others regarding the suspicion which should always be attached to a double sciatica was naturally in the minds of all who examined the patient. The pain was of such a character, or at least was so interpreted, that its full significance was unfortunately minimized. They were, for example, deceived by the frequent almost spontaneous cessation of pain after the administration of the less powerful analgesics. Morphine was at no time systematically given. Up to the time of delivery the feeling was that the sciatic pain was in some way due to the pregnancy. The relatively sudden onset of myelitis, complete in the course of comparatively few days, suggested an inflammatory process due to some unknown cause. The cranial nerve symptoms were not explained, except as a possible consequence of a common infection which had destroyed the cord and affected in less degree the brain. Justification for this opinion was obtained by the report of a number of German cases. It was natural to lay stress upon the transverse lesion of the cord, even while recognizing that myelitis may be due, so far as its symptoms are concerned, to various causes.

Dr. Dercum and Dr. Hun had referred to the question of the optic neuritis. This was, of course, extremely puzzling, and, in fact, Dr. Taylor and his associates could offer for it no adequate explanation beyond the possibility that the entire process in the central nervous system was due to an infection of the nature of which they were in ignorance. The progressive character of the disease, unassociated with temperature, did not, however, particularly help this assumption. The hydrocephalus was quite enough to explain the extraordinarily high degree of optic neuritis present.

Dr. Taylor accepted Dr. Collins' strictures on their diagnostic ability with satisfaction. They possibly should have made the diagnosis, but had Dr. Collins seen the case Dr. Taylor felt convinced that the difficulties which he had expressed in this brief communication somewhat inadequately would have appeared more real to him. He had already spoken of the double sciatica and offered no excuse for failing to interpret its presence correctly in this case. No lumbar puncture was made. Had this been done, it might have helped decidedly in the diagnosis. The tap would, of course, have been dry. The anesthesia was sharply limited, and tests of the upper portion of the body could not have been satisfactorily made when such tests would have shown anything owing to the mental condition of the patient. In general, Dr. Taylor had offered the case simply as one which to the physicians who saw her was extraordinarily difficult of diagnosis. One learns from such a case more than any other one thing that the complaint of pain should be most carefully analyzed and interpreted if injustice is not to be done to patient and physician alike.

A Case of Landry's Paralysis, with Recovery.—By Dr. Wharton Sinkler. (To be published in this journal.)

Dr. J. W. Putnam said there were one or two questions he would like to ask the author. Whether, during the illness there was atrophy of the muscles; whether the tingling and numbness were associated with tenderness along the nerve trunks; how long the tingling and numbness lasted, and whether it was simply premonitory or persistent.

He would like to know whether motion was completely lost; and if so, how long it was completely lost; also, when motion began to return, and what treatment was used.

Dr. Knapp said that the cases which have been reported in recent years, where no lesions have been found post-mortem seemed to him open to suspicion, in that more accurate methods had not been employed.

Some years ago he reported two cases of this disease, one of which made a complete recovery, and another where the recovery was very slow, and there was much wasting.

The striking clinical features of the disease differentiate it so clearly from cases of poliomyelitis and multiple neuritis that there is no difficulty in the diagnosis in typical cases, but as he tried to show in a paper read

before this society a few years ago, the differentiation sometimes cannot be made. Many cases show some sensory perversion, as Landry himself found in his original case.

Dr. Sinkler, in replying to Dr. Putnam's questions, said: There was no atrophy in his case, and there was no tenderness over the nerve trunks. The numbness of the extremities was an initial symptom and lasted but a few days. The loss of power was complete for about a week, and was quite gradual in its onset. It was about ten days before it was complete. Power returned, first in the upper extremities and lastly in the lower extremities. The only difference in the sensibility was that there was slight numbness in the fingers, but the sense of localization was good. The astereognosis to which Dr. Sinkler referred was only temporary. In regard to the treatment: The case was at first treated with aspirin and subsequently with bichloride of mercury in minute doses.

(To be continued.)

NEW YORK NEUROLOGICAL SOCIETY.

March 6, 1906.

The President, DR. JOSEPH FRAENKEL, in the Chair.

Demonstration of Neuro-Fibrils.—Dr. Edwin G. Zabriskie gave a demonstration of normal and pathological neuro-fibrils stained by the Cajal method. The speaker said that so far as his personal observation with this method of preparing the neuro-fibrils extended, it seemed to him absolutely inconclusive, and he did not believe that we were justified in making any positive assumption from it as to whether there were fibers coming from the terminal buttons which communicated with the inter-cellular fibers, as had been claimed.

Do Central Tracts of the Nervous System Regenerate?—Dr. L. Pierce Clark read a paper on this subject, in which he offered the following conclusions:

1. Animal experiments failed to provide conclusive data that central tracts of the nervous system ever regenerated, so that the former function was restored. In warm-blooded animals, and in the human species in particular, an abortive attempt on the part of the cord to regenerate was largely, if not solely, confined to fibers of undoubted peripheral type.

2. Histological analysis of cases of hemisection, compression paraplegia, myelitis, and like destructive lesions of the cord failed to show positive evidence that actual structural regeneration of axis cylinders ever occurred in the central nerve tracts of the human spinal cord. In case of complete division of the brain and spinal tracts, there was simply degeneration, followed by sclerosis.

3. A most acceptable reason for non-regeneration of such tracts was shown in that the component nerve fibers did not possess a neurilemma sheath, from which nerve regeneration mainly, if not solely, occurred. This lack in cord and brain tracts, in contrast to the regenerating peripheral nerves, was due possibly to a difference of embryological origin for the two structures of the nervous system.

4. The seven cases cited by Stewart and Hart for cord regeneration, being merely hemisections, either did not fulfill the conditions of tests, or the evidence for regeneration was not definite or convincing.

5. In cases of complete transverse division of the cord there was not sufficient justification, either from experimental or clinical data, to warrant suture of the spinal cord in an attempt to cure the defect.

Dr. Pearce Bailey said that at one of the recent meetings of the American Neurological Association, Dr. S. Weir Mitchell, in discussing the case

of suture of the spinal cord reported by Stewart and Hart, had expressed considerable doubt in regard to it, and seemed inclined to believe that the cord had not been completely severed.

Most of the reported cases of hemisection of the cord were absolutely worthless as evidence, as in a large proportion of them there was no section of the cord at all; simply a stab-wound and the Brown Séquard syndrome, due probably to contusion. Dr. Bailey said that a number of years ago he saw a case of stab-wound of the spine, with complete Brown Séquard paralysis, which was followed by complete recovery in the course of three or four weeks. The case was evidently one of contusion or hemorrhage of the cord, but the cord was not divided.

Demonstration of Cases Illustrating Results of Peripheral Nerve Anastomosis.—By Dr. Alfred S. Taylor. The first case shown was one of Bell's palsy of twelve years' duration, which was operated on by Dr. Taylor on Jan. 7, 1905, the facial nerve being implanted laterally into the hypoglossal. The muscles, at the time of operation, were completely degenerated. Five months later there was practically no change in the patient's condition, with the exception of the fact that there was some improvement in the condition of the left eye, which had been the seat of extreme lacrymation and conjunctivitis. There was also a slight movement of the muscles of the chin in response to the electric current, and just a shade of motion upon the volition of the patient. Ten months after the operation there was distinct motion of the muscles about the chin and the corner of the mouth, which could be clearly demonstrated by the patient.

The second patient shown by Dr. Taylor was a boy, nine years old, who suffered from facial paralysis after a mastoid operation, which was performed on July 13, 1903. He was operated on by Dr. Taylor on Oct. 24, 1903, and during the twenty-eight months that had elapsed since that operation, there had been a decided improvement in his condition. The asymmetry of the face at rest had disappeared; he had a considerable amount of control of the muscles, and was able to wink the affected eye.

In this case, Dr. Taylor said, the seventh nerve was implanted laterally into the twelfth. The speaker said he had now performed this operation in eight cases, and in all of them where sufficient time had elapsed, positive results had been obtained.

Dr. Taylor next showed a number of cases of brachial birth palsies which he had seen in consultation with Drs. L. Pierce Clark and T. P. Prout. In these cases the damaged section of the nerve was excised, and an end-to-end suture made. The lesion in all these cases was practically the same, and was the result of over-stretching of the nerve roots in the brachial plexus, which led to tearing of the nerve sheaths and fibers, and perhaps to hemorrhages within the nerve sheaths. The ultimate result of such a lesion was the formation of cicatricial tissue, so that the nerve impulses could not pass through the nerve roots, resulting in paralysis of certain groups of muscles. If these palsies were allowed to continue for too long a period of time, the paralyzed muscles would undergo contracture, and even the bones would become changed in their conformation, and produce certain well recognized deformities which it would be practically impossible to overcome, even after the nerve was repaired.

The first case of birth palsy shown by Dr. Taylor was that of a girl, with complete paralysis of the left upper extremity. The operation was done on June 8, 1905, when the child was one year old. The deep cervical fascia was found to be much thickened and adherent, and on exposing the brachial plexus, it was found to consist of one large cicatricial mass extending to the spinal foramina and underneath the clavicle.

As it was found impossible to recognize the individual nerves in this mass of cicatricial tissue the mass itself was excised as a whole, leaving a gap two centimetres long, which was bridged over with loops of chromicized catgut wrapped with Cargile membrane, the idea being to form an artificial canal through which the nerve fibers could regenerate.

About nine months had elapsed since the operation, and the only improvement noted thus far was a certain degree of motion in the muscles about the shoulder joint.

The next case was that of a boy, ten years old, with a birth palsy of the left upper extremity, who was operated on March 14, 1905. Upon exposing the brachial plexus, the fifth and sixth cervical and the suprascapular nerves were found bound down by adhesions and thickened fascia. The proximal end of the suprascapular was tortuous and thinned. After resecting the thickened fascia, the proximal end of the suprascapular nerve was resected and implanted into the root of the fifth cervical.

The boy now had a fairly wide range of motion, but the affected arm was very much smaller than its fellow, and somewhat deformed, as evidenced by the peculiar flexed position of the elbow, with some inward rotation.

Dr. Taylor showed a number of photographs of this case, illustrating the limitations of motion that had existed prior to the operation. The improvement that had resulted from the operation he attributed largely to the removal of the thickened cervical fascia by which the nerve had been bound down. There had certainly been a considerable gain in the range of motion and in the development of the musculature.

Dr. Taylor also reported a case of anterior poliomyelitis, with complete paralysis of the forearm and hand, in which there was a slight return of power after division of the eighth cervical and first dorsal nerve roots, and their implantation into the fifth and sixth cervical.

Dr. L. Pierce Clark, who was associated with Dr. Taylor in these neuro-surgical studies, said that he had treated five cases of infantile cerebral hemiplegia to overcome the extensor muscle weakness in this type of palsy. In all the cases there was extreme foot deformity and spastic contracture. The effort was made to improve the paralyzed extensors (peroneal group) by implanting those nerve bundles of the external popliteal nerve which supplied this group into the internal popliteal nerve. The operation was done just above and posterior to the bend of the knee, at the bifurcation of the sciatic into the internal and external popliteal. The work on all five cases was done about one year ago. But little improvement was to be seen in four of the cases; the fifth, however, a boy twelve years old, had showed marked improvement. The foot had changed from a talipes equinus to that of valgus, or flat foot. There was now nearly as much power in the external peroneal group as in the internal. The patient still had the hemiplegic type of gait, which was slowly being trained away. If this peculiarity of gait could be overcome, the speaker thought we might say there was a reversal of motor centers in the cortex, a question first raised by Kennedy.

Dr. William M. Leszynsky said that in the first case shown by Taylor, that of Bell's palsy of twelve years' standing, he thought it was a question whether the woman would have preferred to go through life with the face distorted on the paralyzed side as the result of secondary contracture, or as she was at the present time. The speaker said he could not imagine a worse condition than in the case shown, so far as the cosmetic result was concerned. The patient still had her lagophthalmus, with complete flaccidity of the left side of the face and apparent atrophy of the muscles. The movements on that side of the face were apparently transmitted through the action of the masseter. The pronounced facial atrophy in this case was an unusual feature, and for this reason the outlook was not very encouraging. Of course, no one could predict the ultimate outcome of the operation.

Dr. J. Ramsay Hunt said it was an interesting question whether there could be a restoration of function in muscles that had been paralyzed for twelve years. In the case shown by Dr. Taylor there was apparently slight motion about the angle of the mouth on the paralyzed side, and in that connection the speaker called attention to the fact that the facial in-

nerve overlapping somewhat, so that in the event of paralysis on one side of the face, there would still remain a few muscular fibers which received their nerve stimulus from the opposite side. This might possibly be the explanation of the apparent restoration of function about the mouth in this particular case, the muscular tissue having received trophic stimuli from the opposite side, and had not degenerated. The speaker said he did not expect that the improvement would extend any further, as two years and eight months had already elapsed. If the operation described by Dr. Taylor proved successful it would certainly be of great value in old cases where there was drooping and inability to close the eye, even if the restoration of function was only partial.

In cases of birth palsy, Dr. Hunt questioned the propriety of excising so much of the thickened and fibrous plexus that the cut ends of the nerves could not be brought into opposition, and trusting to an artificial medium to bridge over the gap between the divided plexus trunks. He did not consider that connective tissue offered an insuperable obstacle to nerve regeneration, as it was nature's method of repairing divided nerves, and he thought that more conservative surgical measures would offer a better chance of ultimate restoration of function.

Dr. J. F. Terriberry said his service at the Hospital for Ruptured and Crippled Children afforded him a large experience in cases of birth palsy of the upper extremities, and the point he wished to emphasize was the uncertainty of the prognosis. He recalled a number of cases in which the result was better than the operative result in any of the patients shown by Dr. Taylor. One of his cases, a child of thirteen years, with the Erb type of paralysis, had been under observation since her second year, and although the affected muscles had grown to fair size, and responded to the faradic current, there was very poor extension of the forearm, supination, and extension of the wrist. These facts had led him to carefully observe this case, and he had found that attempts to use the weakened muscles were accompanied by diffusion of energy throughout the arm, the weakened muscles being overpowered by their healthy antagonists. As this paralysis occurred at a time when many of the function groupings were not learned, it occurred to him that that fact probably accounted for the wide diffusion of energy upon attempts at using the weak muscles. Acting upon that supposition he attempted to educate these muscles to their particular work, and with most gratifying results. In the past four months that case had made more progress than had been obtained after a number of years of electricity, massage and general instruction to use the arm as much as possible. It was remarkable to observe how the energy, at first widely distributed over the arm muscles, had become localized, so that the child was now able to almost perfectly functionate the weakened muscles, unhampered by their healthy opponents.

As to operating on this class of cases, Dr. Terriberry said it might be well to do so, but the operation should not be undertaken too early, because in many instances there was marked improvement even after one, two or three years had elapsed. The internal rotation of the arm, which was very marked in one of the cases shown, was usually the first symptom to disappear.

Dr. Terriberry said that Dr. Taylor's results in the cases of palsy of the face were certainly remarkable, and the final result would be extremely interesting.

Dr. Smith Ely Jelliffe said he had seen all the cases shown by Dr. Taylor, some of them both before and after the operation, and from his own observation he could say that almost without exception they had distinctly improved. How much of the improvement was due to the operation, and how much to the incessant efforts that had been made to educate and train the impaired muscles, he was unable to say. He was inclined to feel, however, that we are justified in believing that a residual amount of good has been gained by the operative procedure in these cases,

and even assuming that this was not so, we have still gained an enormous amount of information in reference to the technique of the operation, which will undoubtedly prove valuable in the future.

Dr. Arthur C. Brush, of Brooklyn, N. Y., said he was inclined to believe, with others, that the majority of cases of infantile paralysis recovered, or nearly so, in the course of time. He had been able to trace quite a large number of cases that had been more or less directly under his own observation, and in one instance only, that of a boy of twenty, was there still great loss of function in the paralyzed arm. Nearly all of them still showed some loss of power, but it was usually very slight. In the cases shown by Dr. Taylor, the operative procedure undoubtedly hastened the progress of the cure, which was more rapid than it would have been if electricity and manipulation had been solely relied on.

Dr. L. Pierce Clark said in reply to the suggestion made by Dr. Hunt that the restoration of function about the angle of the mouth in his case operated upon by Dr. Taylor, and shown this evening, was due to an overlapping innervation from the opposite side, he said the facial nerve on the right side had had an opportunity for over twelve years to take up this function, and had not done so. Why should motion return promptly at the end of the fifth month after facio-hypoglossal anastomosis if there was not a regeneration of the left facial nerve over the hypoglossal union? Prior to that operation, every possible medical means had been employed to restore function, but without the slightest result. He thought there could be no question that at present the hypoglossal nerve was transmitting nerve impulses into the muscle nerve endings of the facial to the left side. The woman had been told by him repeatedly before operation that electrical responses indicated that all the muscles above the left angle of the mouth were degenerated, and that probably in case of a successful issue of the operation she could only expect motion in the muscles at and below the left angle of the mouth. He thought that promise was now near fulfillment. Probably, as was well known, and as Dr. Hunt had remarked, the reason why atrophy in the muscles about the left side of the mouth had not occurred to any great extent was due to the slight trophic influence of the overlapping facial nerve of the opposite side.

In discussing the series of cases of brachial birth palsy which he and Dr. Taylor had been interested in, Dr. Clark thought it was very unlikely that the nerves would ever worm their way through the dense scar tissue, as suggested by Dr. Hunt. Careful study of a very large number of these cases had never shown the slightest evidence that this sort of repair was taking place; on the contrary, in many cases an actual recoil of the new nerve fibers from the scar obstacle had been shown by Dr. Prout.

The statement that the prognosis of brachial birth palsy was usually favorable was entirely at variance with his personal observation and literature research. Non-recovery was placed as high as 70 or 80 per cent. by Bruns. Obstetricians, who saw all the cases, agreed with neurologists in giving an unfavorable prognosis. While the good effects of a more or less constant training which these operated cases had received was somewhat of a rebuke to the pessimistic neurologist, yet the speaker did not believe the improvement in the cases could by any means be attributed to this training solely.

Dr. T. P. Prout said that in speaking of the recovery of these cases it was well to bear in mind the nature of the lesion we were dealing with. When we considered the fact that this scar tissue had been produced in the nerve trunk, it was impossible to conceive how complete recovery could take place. The scar tissue was the direct result of the severing of the sheath of the nerve and hemorrhage into the nerve itself, which subsequently became organized and produced scar tissue. The only way by which we could hope for ultimate recovery was to remove the scar tissue. This would at least relieve the pressure, which was one of the factors that prevented the nerve from regenerating.

Dr. Edward D. Fisher said that while it was of not infrequent occurrence, especially in dispensary practice, to see cases of birth palsy improve with little or no treatment after two or three years, those were evidently not the kind of cases that had been reported by Drs. Clark and Taylor. In those cases, no doubt, long-continued treatment by manipulation and electricity had been tried without success. Cases of birth palsy could be practically divided into two classes; namely, those that would recover with little or no treatment, and those that would fail to improve in spite of faithful and long-continued treatment.

In referring to the cases of facial paralysis, Dr. Fisher said that no one could demonstrate that the muscles on the affected side had absolutely disappeared throughout their entire structure, or that their innervation was entirely cut off. If any muscular fibers still remained, whether the paralysis had lasted for five years, or for twelve years or longer, there was a possibility of regeneration of the muscle if the nerve force was restored. If it could be actually demonstrated that all the muscular fibers had disappeared then these operations could be of no avail.

The President, Dr. Fraenkel, said the most important point at issue seemed to be whether any muscular tissue was left, and this was difficult to determine. The speaker said he agreed with what had been said in regard to the circular muscles of the mouth being innervated from both sides, and in the case shown by Dr. Taylor he did not think the fact had been demonstrated beyond doubt that the operation had resulted in a re-awakening or regeneration of the orbicularis oris on the affected side.

Dr. Taylor, in closing, said that as a surgeon he was interested to learn how little faith the neurologist had in nerves. In the first case of facial paralysis, to which Dr. Leszynsky had alluded, the condition had lasted twelve years, and the operation had been done only fourteen months ago, and still there were evidences of some return of power. Even in the most favorable cases, no improvement was looked for in less than six months. Cases were on record where there had been a restoration of muscular power after thirty years. About a year ago, Dr. Charles A. Elsberg showed a case of facial paralysis of over twenty-nine years' standing in which there was some return of power after an anastomosis of the facial and spinal accessory nerves. In that case, the improvement was noticed within six or eight months after the operation. The case was an unusually favorable one, as the patient was a woman of means, and had submitted to continuous massage and electrical treatments, thus maintaining the trophic condition of the muscles on the affected side.

Dr. Taylor said that the mere fact of the absence of electrical reaction did not demonstrate that there was no muscular tissue left. The insertion of the electric needle through the skin and fat tissue sometimes produced a reaction when the usual methods failed to cause any response. When even a small nest-egg of muscle was left, it might be increased by the proper stimuli. In his own case, the patient was certainly very well pleased with the result thus far obtained, and more was hoped for in the future.

In alluding to the statement made by Dr. Hunt that the formation of a cicatrix in the brachial plexus was nature's way of healing the breach in the nerves, Dr. Taylor wondered that nature's method was not more successful. In the orthopedic hospitals and dispensaries it was of daily occurrence to see children ranging in age from four to twelve years, with extremities that were practically useless from this disability. If, therefore, the percentage of spontaneous cures was as high as some of the speakers had mentioned, then the number of original cases must be very great.

A Case for Diagnosis.—Presented by Dr. William B. Noyes. The patient was a man, aged forty-nine, a painter by occupation, who had a fairly definite history of syphilis, but denied alcoholic excess. In 1872 he received a stab-wound in the left arm, causing a permanent ulnar paralysis. In September, 1905, while working near a third rail he received a strong shock of electricity, which prostrated him for some days. He noticed, after

this, rapidly increasing paralysis of the muscles of his arms, which soon made it impossible to work. More careful investigation proved that he had been growing weak in his left arm for at least two years, and that his right arm for the past year had been causing him constant pain and weakness in the region of the shoulder. Examination showed that he had marked atrophy of the muscles of the shoulder and arm, a loss of faradic reaction, especially marked over the right deltoid, pectoralis major, and the extensors and flexors of the right arm, with weakness of the left deltoid, and absolute paralysis of the left ulnar group of muscles. There was also a reduction of galvanic reaction, rather than a definite reaction of degeneration. There were fibrillary twitchings. Sensation was normal to touch, pin-prick, heat and cold. After two months' treatment, the weakness of the muscles of both arms, shoulders and hands increased so that he became helpless. The knee jerks became increased, and a definite Babinski reflex was present. Pain in the arms and shoulders was present at times.

The original diagnosis was progressive muscular atrophy, of spinal origin. The old ulnar paralysis was an independent lesion, and was due to a cut. The case had advanced while under observation, until now a diagnosis of amyotrophic lateral sclerosis was possible. It indicated the progression of cases of chronic or progressive anterior poliomyelitis, with involvement of the pyramidal tracts, the process descending the cord instead of ascending. It also indicated that amyotrophic lateral sclerosis was simply a stage in progressive muscular atrophy.

The shock of electricity hastened, but did not cause the disease. The real cause was to be looked for in the syphilitic or lead poisoning, or both.

Dr. Terriberry thought the case was possibly one of lead infection.

PHILADELPHIA NEUROLOGICAL SOCIETY.

December 18, 1905.

The President, DR. JOSEPH SAILER, in the Chair.

Dr. Clifford B. Farr exhibited, by invitation, a case of bilateral cervical rib, with symptoms of pressure on the left brachial plexus.

Dr. M. H. Bochroch reported a case of apoplexy, with convulsions confined to the non-paralyzed side.

Dr. C. D. Camp read, for himself and Dr. C. W. Burr, a paper on "Multiple Sarcomata of the Brain and Cord."

Note on the Occurrence of the Gordon Reflex in a Case of Localized Pachymeningitis Hemorrhagica.—Dr. Dercum detailed briefly the following case: J. P. Age thirty-five. Suffered from frontal headache and marked somnolence. In the course of four or five days a transient ptosis of the right eyelid and dilatation of the right pupil made their appearance. At the same time it was observed that the left knee jerk was exaggerated, and that a distinct Babinski sign could be elicited upon the same side. The Babinski sign, though present, was not typical. On the other hand, the Gordon reflex, which was elicited by deep pressure made over the gastrocnemius at its passage into the tendon, was not only present, but was very pronounced. It was elicited with very great readiness. The patient not improving, but becoming more somnolent and stuporous, an operation was decided upon, a large osteoplastic flap being made over the right frontal region by Dr. W. W. Keen. As soon as the skull was opened, a large quantity of cerebrospinal fluid, containing some clots, escaped. Drainage having been established, the flap was replaced. On coming out of the anesthetic, the patient was conscious with complete lucidity and

disappearance of headache. The exaggerated knee jerk on the left side had also disappeared, as had likewise the Babinski sign and the Gordon reflex.

For five days after the operation the patient progressed favorably. He then, however, again became somnolent, together with a prompt return of the Gordon and Babinski signs and a plus knee jerk upon the left side. De Keen decided not to re-open the old flap, but to make a trephine opening upon the opposite side, which was done with a negative result. The patient died a few days later, death being preceded by several left-sided convulsive seizures.

An autopsy revealed a large hemorrhage which had taken place on the right side between the dura and the bone in the osteoplastic flap, besides a second hemorrhage into the substance of the dura, separating it into its two anatomical layers.

The fact that the Gordon sign was so pronounced, the fact that it could be elicited with such ease provided pressure was made over the proper place, and the very evident relation which it bore to the lesion on the opposite hemisphere coming and going, so to speak, with the exudation and hemorrhage, are most interesting. It certainly seems to give the Gordon reflex a distinct semeiological value.

Dr. Weisenburg criticized Dr. Gordon's method in obtaining Oppenheim's reflex. According to Oppenheim, deep pressure should be made along the side of the tibia in a most energetic manner, whereas Dr. Gordon only gently stroked this part. Dr. Weisenburg did not believe that the extensor response of the large toe, as obtained by Dr. Gordon, was different from that obtained by Babinski or Oppenheim. It is well known that any involvement of the pyramidal tracts, due to a central or spinal lesion, will cause a loss of some power in the flexors of the toes. Such patients, when walking or moving their limbs, will constantly have an extensor movement of the large toe, and sometimes of all the toes. In a case of excessive spasticity any voluntary movement of the lower limbs, or irritation of any portion of the skin or of the muscles of these limbs will cause an extension of the large toe, or a typical Babinski response. Any method employed to elicit the extensor response is of some value and should by all means be used, but no distinction should be claimed for any one method, the result of which after all gives similar results.

In answer to Dr. Weisenburg's criticism Dr. Gordon stated that it was his custom to test for the reflex with the hammer, but not having one with him at the time he had used his fingers instead, making deep pressure along the sides of the tibia.

PHILADELPHIA NEUROLOGICAL SOCIETY.

January 23, 1906.

The President, DR. JOSEPH SAILER, in the Chair.

A Case of Double Facial Palsy of Cerebral Origin.—This was exhibited by Dr. Maier for Dr. Spiller. The patient, a man sixty-two years of age, had had two apoplectic attacks. His bilateral facial paralysis was of recent development. He could not close his eyelids or wrinkle his forehead well on either side, and had very little voluntary power in the lower distribution of the facial nerve on either side, but a little more on the right than on the left. Faradic irritation of the seventh nerve or of the muscles of this distribution gave prompt response on each side of the face. The left upper limb was completely paralyzed. The biceps and triceps reflexes were exaggerated on the left side and were prompt on the right side. The left

lower limb was completely paralyzed except at the hip joint. The left limbs were not flaccid. The patellar reflex was exaggerated on the left side, and normal on the right. Ankle clonus and the Babinski reflex were obtained on the left side, but not on the right. Sensation was normal everywhere. The voluntary power of the right upper and lower limbs was normal.

Dr. Spiller stated that he had asked Dr. Maier to show this case as being one of unusual interest, inasmuch as there was a question as to whether there was a peripheral facial palsy on each side or whether it was central in origin. He was inclined to think it was central, although of the peripheral type. The man very clearly had had two cerebral attacks, after which the bilateral facial palsy had developed. When Dr. Spiller had first seen the patient the facial palsy was very marked on the right side, although there had since been some improvement on this side, and to some extent on the left. He stated that he first tested the electrical reactions in December, a few weeks after the development of the palsy, and got prompt response over the seventh nerves and their muscles, and while this was not a positive proof that the palsy was central, it was at least indicative of it. He believed that the man had had a small lesion in the left side of the brain at the knee of the internal capsule which involved the fibers for the face, and that he had since regained, in part, the power in the right side of the face. Later he had had a complete lesion involving the internal capsule on the right side. He thought it would be difficult to consider this a peripheral facial palsy, even though the upper part of the face was much involved. The implication of the upper part of the face could be explained by a lesion on each side of the brain cutting the fibers innervating the upper part of the face on each side. The complete hemiplegia on the left side, the prompt reaction to the faradic current in the face and the deviation of the tongue to the left, all led him to the belief that the palsy was of central origin. He thought the reason there were no bulbar symptoms in this case was because fibers controlling the muscles of the throat may be separate from those for the face and need not be involved when those for the face are involved.

Dr. Dercum thought Dr. Spiller's explanation an ingenious and a possible one, but believed there was also a lesion here nuclear in character. He thought it possible that the man had a polioencephalitis.

Dr. Gordon did not know of any reported case of complete hemiplegia having this involvement of the face. From the history he believed all the symptoms could be accounted for by hemorrhage in the pons. He thought the assumption of a bulbar origin would explain all the symptoms that the man presented.

Dr. Pickett referred to a case at the Medico-Chirurgical Hospital, of hemiplegia, doubtless embolic in character, which showed the peripheral facial type of palsy as a part of the hemiplegia. This disappeared in three weeks. He did not think it a rare condition. He thought that if this palsy were central, the bilateral innervation would not be operative, and we would get peripheral palsy on both sides.

Dr. Weisenburg stated that he had at first thought that the man had a peripheral facial palsy on the right side, but later that he had a hemorrhage in the right internal capsule causing left hemiplegia.

Dr. Mills thought Dr. Spiller's explanation quite possible, and the true explanation.

Dr. Spiller, in replying, stated that he did not see how the lesion could have been in the pons. To assume that it was located there would imply that the lesion had involved both facial nuclei and the right pyramidal tract, above the decussation, but the facial palsy on the right side was less severe than on the left side, and yet the hemiplegia was on the left side. It could hardly be supposed that such a lesion could avoid the left pyramidal tract in the pons, which it must have done if it were in the pons. The marked implication of the upper part of the face on each side could only be explained by a lesion on each side of the brain

in the fibers for the innervation of this part of the face, or by peripheral palsy. The latter seemed improbable. If the paralysis on either side of the face was caused by a lesion in the facial nerve, the marked paralysis of the upper part of the face on the other side could not be explained by a central lesion.

A Case with Lesion in the Conus Medullaris.—This was exhibited by Dr. Howard M. Fussell by invitation.

Dr. Eshner thought it possible that there were multiple lesions in this case, and in that way the lumbar segments of the cord would be affected and the knee jerks lost.

A Case of Obscure Functional Spasm with Myotonia.—This was exhibited by Dr. F. X. Dercum.

Dr. Eshner thought the case might belong to one of the occupational neuroses. It seemed that a variety of movements induced the spasm just as repeated movements resulted in other occupational diseases, or as repeated efforts at writing cause scrivener's palsy.

A Case of Huntington's Chorea and a Case of Cerebral Diplegia.—These were exhibited by Dr. Van Gasken.

Unilateral and Bilateral Convulsions in Apoplexy.—Dr. William G. Spiller made some remarks on this subject.

Dr. Mills thought this subject quite interesting from a physiological as well as a clinical point of view, and that it is perfectly true, as Dr. Spiller had said, that usually convulsions do not occur in cases of hemorrhage that destroy the internal capsule. He said that it was the common experience in a multitude of cases of paralysis due to hemorrhage from Charcot's artery of cerebral hemorrhage that in the majority of cases convulsions are not present, although they are occasionally met with, as is also tonic spasticity. He stated that physiological experiments had indicated that the pyramidal tracts when separated from their centers are irritable. In one of the earliest of the American experiments, which is classical in the history of localization, the current was first applied to the cortex, and then a flap of the cortex was turned up and irritation again applied, and similar results were obtained in both cases. Dr. Mills thought it could not be decided that the pyramidal tracts are not irritable.

Antero-Retrograde Amnesia.—Dr. Alfred Gordon read a paper on this subject.

Two Cases of Syringomyelia with Necropsy.—This paper was read by invitation by Mr. H. S. Hutchinson.

Dr. Weisenburg stated that he had reported a case of syringomyelia with choked disc, his case being the third on record. Hydrocephalus had been the cause of the choked disc. He said that in no such case had the diagnosis of syringomyelia been made during life.

Dr. Mills referred to a case under his care which presented symptoms of syringomyelia in the upper extremities and to a certain extent in the lower extremities. The case had spastic contractures in the lower extremities with paraplegia, exaggerated reflexes, and had also the beginning irritative phenomena in the lower extremities, pain in the limbs and back, and recently pain in the trunk and upper extremities. He had concluded, however, that the proper diagnosis was pachymeningitis.

PHILADELPHIA NEUROLOGICAL SOCIETY.

February 27, 1906.

The President, DR. D. J. MCCARTHY, in the Chair.

A Case of Huntington's Chorea, and a Case of Lead Paralysis of the Upper Arm Type.—These were exhibited by Dr. Charles S. Potts.

Two Cases of Korsakoff's Psychosis with Recovery.—These were reported by Dr. T. H. Weisenburg.

Dr. Spiller stated that he had asked Dr. Weisenburg to report these cases because some authors say they have never seen recovery from this condition.

Dr. Burr thought for the sake of historical accuracy this set of symptoms should not be called after Korsakoff. He stated that in 1789 the picture that we now call Korsakoff's disease was known. Dr. Burr thought it probable that the men who believe that multiple neuritis associated with these symptoms is always incurable, belong to a class of physicians who are in institutions where none but the worst cases are seen. In private practice these mental symptoms do disappear. He cited four cases which had shown great improvement. One of these patients he stated had been left with weak mental power, she is silly, does not know the relative importance of events, and is a little more pleased with life than she ought to be. One of the other patients is as mentally sound as she ever was, and the other two are in a fair mental state. These four cases he had treated in private practice, and he had seen several others recover either wholly or in part.

Dr. Hawke referred to the two cases reported by Drs. Peterson and McCarthy last year, and stated that one of them died after being in the hospital a few days, but that the other case is now mentally well. She had to be operated on last September on account of foot-drop, but she can now walk without any assistance. The psychosis, the mental condition, he thought is similar to alcoholic confusional insanity with the exception that the illusions of identity are more prominent. He stated that more than 75 per cent. of the cases of alcoholic confusional insanity recover, and if these cases do not die of complications soon after admission they are apt to have full mental recovery.

Dr. Pickett stated that he wished to take issue with Dr. Burr in speaking of the well-known fact that Korsakoff was not the first to describe this symptom-complex. He stated that Korsakoff in his first paper in 1887 gave credit to Magnus Hess and others, and that Korsakoff only claimed credit for first calling attention to this as an entity, not only as an alcoholic condition, but as a result of other forms of intoxication. He stated that he had not found Korsakoff's psychosis at all similar to alcoholic confusion. In Korsakoff's psychosis he stated that the patient is almost free from hallucinations. Korsakoff, in his early papers, said very little about confusion. The patient is not in terror, but is in a state of mild confusion. He stated that he had exhibited this patient of Dr. Weisenburg's in clinic last week, and he did not consider her entirely well, she has a terminal weak state and seemed slightly childish and demented.

Dr. Burr stated that he would like some one to tell him whether Korsakoff's psychosis is an entity, whether it is a disease such as typhoid fever, pneumonia, locomotor ataxia; or whether it is not, after all, a combination of symptoms. As a matter of fact the symptoms of Korsakoff's disease occur not only in alcoholic neuritis, but in neuritis from other causes. In insanity of the aged, if you did not know the history of the case and the symptoms were put before you, you would say it was a case of Korsakoff's disease. The symptoms also are seen in syphilitic brain disease. In his opinion it appeared to be only a combination of symptoms that occur in many diseases, and is not an entity in itself.

Dr. Weisenburg thought credit should be given to Dr. Mills for describing Korsakoff's disease in 1889.

A Brain with Multiple Secondary Adenomatous Carcinomatosis of the Meninges, Resembling in Gross Pathology and Symptomatology Cerebro-spinal Syphilis.—This specimen was exhibited by Dr. McCarthy.

Dr. Spiller stated that he wished to present to the Society a specimen which he thought very interesting. He had seen in consultation one case where the peritoneum was covered with carcinomatous nodules, and the patient died from carcinoma. He had had two cases of carcinoma of the vertebræ, one case of carcinoma implicating the oculomotor nerve, and a very curious case where a carcinoma was removed from the penis, in

which peculiar bulbar asthenic symptoms developed. These cases he had reported with Dr. Weisenburg. In the case from which the specimen exhibited was taken, there was carcinoma of the vertebræ, of the brain, cerebral dura, and elsewhere. The symptoms were those of myelitis. The man had been under his care at the Philadelphia General Hospital. He had become rather suddenly paralyzed in his lower limbs, and had loss of sensation in these limbs. At first he had no pain, but later pain developed, but was not severe. He had loss of motion and of sensation in the lower limbs, and loss of control of the bladder and rectum. He had no mental symptoms, and these tumors upon the cerebral dura produced no symptoms. The bone of the skull over the dura was much thickened. There was a carcinoma in the temporal lobe and carcinoma in the sixth, seventh and eighth thoracic vertebræ. One of the minute tumors was cut from the dura, and proved to be carcinoma. Dr. Spiller believed it impossible to make a diagnosis in these cases of carcinomatous meningitis as the symptoms are so much like those of cerebrospinal syphilis. He recalled a case reported by Drs. Keen, Dercum and himself in which there was an endothelioma of the Gasserian ganglion and multiple endotheliomata of the cerebral dura, each about the size of the head of a pin.

Dr. Funk described the results of the autopsy in Dr. McCarthy's case. A tumor was situated near a bronchus. The cavity was surrounded by a wall and contained a granular substance like that in a tuberculous cavity. The nodule in the liver looked at first like a gumma. The tumor in the pancreas he had believed to be a carcinoma, and it proved to be a scirrhus carcinoma which he believed was primarily in the pancreas. The substance around the carcinoma in the liver was composed of fibrous tissue. He believed the tumor in the lung was independent of those in the pancreas and liver. It contained cylindric cells.

Dr. Weisenburg stated that in 1888 Seifert reported four cases of multiple carcinomatosis of the nervous system. Altogether there were seven cases of multiple carcinomatosis reported, which goes to show how rare the condition is. There had never been a case in which the diagnosis was made clinically.

Dr. McCarthy stated that if the symptoms occurred over again in another case he would have to make the same diagnosis of syphilis. He had a specimen of multiple gummata which was not unlike this particular specimen, and the reason he thought at the time that this was a case of syphilis of the nervous system was because it resembled somewhat that other case.

Puerperal Insanity. A Statistical Study from the Philadelphia General Hospital.—Dr. William Pickett read this paper.

Dr. Dercum did not believe that any causal relation could be ascribed to pregnancy or lactation with regard to paresis and that only a very secondary relation could be ascribed in relation to dementia præcox. He thought the condition must be a symptom-group, and that in alcoholic cases it can assume the type known as Korsakoff's psychosis.

Dr. McCarthy said, in connection with puerperal insanities and paresis, that he had recently studied the case of a woman whose first child was born dead of syphilis, and that the second child was a fairly normal healthy child, the mother having been put on anti-syphilitic treatment in the meantime. In her third pregnancy, however, she went into convulsions, after which she was in a maniacal condition for a time.

Dr. Gordon wished to call attention to a peculiar observation made by him in the detention wards. He said that the histories accompanying patients sent to the detention wards all stated that the mental symptoms developed in from two to four weeks after delivery of the child. He stated that he could not understand what connection Dr. Pickett found between paresis and dementia præcox. He thought this subject should be confined to the mental phenomena, due exclusively to the puerperal state.

Dr. Dercum stated that he was a great admirer of Dr. Pickett's statisti-

cal studies. He thought, however, that when we select a special case we are apt to interpret it according to our own ideas. It should be remembered that simply because a woman is pregnant when she becomes insane, the insanity must not be ascribed to pregnancy.

Dr. Pickett said he was not surprised at the criticism of Dr. Gordon and Dr. Dercum. If he had been able to take more time in the reading of this paper he could have quoted many foreign writers who mention puerperal paresis and who recognize it very clearly. He could also have shown tables which correspond very closely to the one he had just read. He stated that he had not included a case in his report that he was not fully convinced was paresis. He thought that if a woman who had been perfectly well up to the time of conception and through the greater part of her pregnancy and in the latter part of pregnancy, or during delivery, shows mental symptoms for the first time, and these symptoms develop into the typical signs of paresis, associated with the physical signs of that disease, there was no escape from the conclusion that the condition was due to pregnancy.

Neurofibrillar Changes in a Case of Paresis.—This paper was read by Dr. S. D. Ludlum.

Dr. Price stated that in some work done by him during the past year, during which time he examined a large number of normal specimens, he had seen no changes such as Dr. Ludlum had described. In certain pathological states, however, such as pernicious anemia and hydrophobia, there were changes identical with those mentioned by Dr. Ludlum.

Skiagraphs Illustrating the Hip Joint in Advanced Cases of Acute Poliomyelitis.—These were presented by Dr. R. S. Laveson.

Periscope

Deutsche Zeitschrift für Nervenheilkunde.

(Band, 27. Heft, 1-2.)

1. Familiar Spastic Paraplegia. NEWMARK.
2. Cysticerci in the Human Brain. SATO.
3. Contribution to the knowledge of the Secretion of Tears in the Subsequent History of Three Cases of Facial Paralysis with Absence of Tears; with Remarks Upon the Sense of Taste, and Upon the Disturbances of Sensation in Facial Paralysis. SCHREIBER.
4. The Significance of Cholin in Epilepsy, with a Contribution to the Absence of Cholin and Neurin, and Upon the Chemistry of the Cerebrospinal Fluid. DONATH.
5. A Case of Symmetrical Gangrene of the Extremities After Pneumonia. SEIDELMANN.
6. Contribution to the Pathology and Histology of the Tabetic Foot. IDELSOHN.
7. Investigations by Means of a New Reflexometer Upon the Therapeutic Irritation of the Spinal Cord. BÜDINGEN.
8. A Case of Hematomyelia in Association with Carcinomatous Metastasis in the Lumbar Cord. TANIGUCHI.
9. Book Reviews.

1. *Spastic Paraplegia*.—Newmark makes a further report on two cases of familiar spastic paraplegia. The first report was made eleven years ago, and since that time the two affected members of the family, a brother and sister, have remained in about the same condition, although the girl, now twenty-seven years of age, thinks that walking is a little more difficult than it was in childhood. In a second family there were fourteen children; of these four died in childhood or infancy. Of the remaining children one developed slight stiffness of the legs at the age of 16; another at the age of 7½; a third at the age of 8, after an infectious condition; a daughter between the ages of 11 and 19; another son at the age of 8; another daughter at the age of 6. Two sons, one of 14 and one of 10, and one daughter of 5 years, appeared to be normal, although the boy of 10 regarded himself as affected, and all three have active knee reflexes. That is, of the nine children who lived, six have signs of spastic paraplegia. In none of the cases were there disturbances of sensation, of the sphincters or of the intelligence. There was no history of cases in other generations of the family, and no cause, such as consanguinity of the parents, or the existence of infectious processes, could be determined. One of the sons suffering from marked spastic symptoms died of tuberculosis, and the examination of the central nervous system showed in the sacral and lower lumbar regions degeneration only of the pyramidal tract. In the middle lumbar region changes in the posterior columns began to appear. These occupied the median portion. In the dorsal region degeneration of the pyramidal columns diminished upward. The sclerosis of the median posterior columns became intense. In the cervical portion there was no degeneration of the lateral columns, but the median and posterior columns remained sclerosed. The cerebellar lateral tracts were not involved, but the cells in Clarke's columns were diminished in number and shrunken. There was also hydropic degeneration in the fibers in the columns adjacent to the sclerosed areas, which he regards as an exogenous complication of the primary systematic degenera-

tion of the lateral and posterior columns. He describes the changes found in the nervous system by other investigators.

2. *Cysticerci in the Human Brain*.—A man of thirty-seven, with symptoms of chronic nephritis, complained of severe headache. At the autopsy the convolutions and sulci of the brain were normal; all the ventricles were distended; there were evidences of inflammation; and in the left ventricle there was a yellowish bladder-like body containing the head of a parasite. A woman twenty-four years of age had pain in the right lower portion of the abdomen, and vomiting. Appendicitis and peritonitis were diagnosed, an operation performed, and the patient died. Just behind the optic chiasm a calcified cysticercus was found. A man of nineteen had had gastric disturbance and occasionally headache. Hyperchlorhydria was determined, he suddenly developed temperature and intense headache, and died with symptoms of respiratory paralysis. A cysticercus in the fourth ventricle was suspected, and a collapsed cysticercus was actually found in that situation. The ependyma was thickened. A man of forty-three had had headache for twenty years. There was some stiffness in the back of the neck, but no other indications of nervous lesion. The headache continued to be intense, and the patient died suddenly without apparent cause. A doubtful diagnosis of cerebellar tumor was made. At the autopsy the floor of the third ventricle was bulging, the ventricle was distended, and the fourth ventricle contained a great translucent, adherent mass which was found to be a cysticercus containing a dead, calcified parasite. In all these cases microscopical examination of the ependyma showed the presence of granulation tissue, extending deeply into the nervous substance, and containing numbers of giant cells. Sato has collected the statistics of this condition, and found 76 per cent. of all the cases occur in men. The great majority are found in patients between the ages of 30 and 60 (82 of 102 cases, or 80 per cent.). He recognizes four forms of the cysticercus racemosus; one in which the bladders are irregular; one in which there are two or more variously sized cysts; one (the acinous form) in which the projections from the cysts are sharply limited, the different bladders appearing as stalked berries; and one in which the cysts are clustered together like grapes. The different types may occur in a single case. Symptoms of brain irritation such as convulsions, occur almost exclusively when the cysticercus is located at the periphery. There may be no clinical symptoms. In other cases there is headache, or epilepsy, with disturbance of intelligence. Sometimes the symptoms of brain tumor appear. In 31 of the 128 cases epileptic symptoms were present. In 48 cases the ventricles were involved. The symptoms were headache, vertigo, and very frequently sudden death, particularly if the cysticercus was in the fourth ventricle. In 24 cases the cysticercus was situated at the base of the brain, or in the cerebellum. These patients suffered from headache, vomiting, vertigo, and sometimes lesions of the cranial nerves. The diagnosis, at present, can only be made with likelihood, not certainty.

3. *Tears and Facial Paralysis*.—Schreiber, after discussing the literature of the subject, reports a series of cases of facial paralysis, all characterized by loss or diminution of the secretion of tears. In addition there was diminution of the electro-cutaneous, touch, pain and temperature senses upon the affected side, and in the third case the patient had hyperacusis, and complained of tinnitus in the ear on the same side; and the left (paralyzed) side of the tongue, and the mucous membranes of the left side of the mouth were dryer than on the unaffected side. This patient had had bilateral inflammation of the middle ear one year before the paralysis developed. Schreiber analyzes the published cases, and agrees with Goldzieher that the facial nerve probably controls the secretion of tears. In reference to the taste sense, Schreiber is inclined to agree with Erb, that the anterior two-thirds of the tongue are supplied by the trigeminus, and the posterior third by the glosso-pharyngeus. In 58 cases of peripheral facial paralysis that Schreiber has personally observed, he found 26 dis-

turbances of sensation. This is probably due to the fact that fibers pass from the ascending root of the trigeminus into the facial nerve, for which there is anatomical proof.

4. *Cholin in Epilepsy*.—Donath has made careful chemical and microscopical studies of the cerebrospinal fluid obtained by lumbar puncture from epileptics. He finds that it contains cholin, and that this cholin is capable of producing violent convulsions in animals. The method was as follows: The fluid obtained under sterile conditions was neutralized with HCl, dried over the water-bath to a brownish mass, and extracted with absolute alcohol which dissolved the cholin chloride, but not the alkaline salts of HCl. The cholin chloride was then precipitated with platinum chloride, as a cholin-chloro-platinate. This was recognized by its solubility in cold water, and the characteristic microscopical crystalline forms. Donath has subjected 64 cases of various forms of nervous disease, which included 22 of epilepsy, to this investigation. Of these 22 cases 19 showed cholin. Of the other cases the organic forms of nervous disease showed it in a large proportion of cases, indicating a degeneration of the nervous tissue, increased liberation of lecithin, and the separation from it of the cholin. It appears, although it is not certain, that the amount of cholin is proportional to the severity of the disease process. Among the other constituents the most important, from the standpoint of quantity, is sodium chloride, also ammonium chloride, phosphoric acid, rarely, lecithin, and frequently a substance which reduces copper. Donath does not decide whether this is sugar or pyro-catechin. Cholin was not found in the blood or urine of these cases. Injected into the cortex of the brain, or beneath the dura in animals, cholin produces severe tonic and clonic spasms, often leading to paralysis. Control experiments performed with sodium chloride solutions were negative. The paper is concluded with a review of the literature upon the physiological action of cholin.

5. *Gangrene of Extremities*.—Nine days after convalescing from an attack of pneumonia a woman of twenty-nine developed cutaneous hemorrhages upon the skin of the hands and forearms. Ten days later there was an attack of pain with a feeling of cold and tenderness in the fingers which became blue in color, and later swelled. Eight days later the edges of the ears were also involved, and three days after this the toes also. Ramification of the terminal phalanges of the fingers and toes occurred, and finally separation. The case corresponds to Raynaud's disease, the only difference being the existence of a distinct etiological factor preceding the attack of pneumonia.

6. *Tabetic Foot*.—Idelsohn reports a case of slowly progressive tabes in a man who died at the age of 73. There was a typical tabetic foot with the characteristic proliferation of the bone at the epiphyses and the porosity of the bones of the tarsus which are characteristic of tabetic arthropathies. There was also arterial sclerosis. Over the exostoses there were alterations in the skin. In discussing the etiology of this condition he does not believe that it is due to a peripheral neuritis; otherwise it would be exceedingly common.

7. *Investigations by Reflexometer*.—Büdingen gives a careful description of his reflexometer, which is entirely too complicated to be reproduced in an abstract, but which consists essentially in a table upon which the patient sits, a movable wire frame, which rests against the shin, and to which weights can be attached, a board hinged to the surface of the table which can be held at any desired angle to support the leg, and a complicated striking apparatus by means of which a blow of definite force can be struck upon the patellar tendon. He withholds statistics obtained by investigations with this instrument, but describes curious results obtained in two cases of transverse myelitis in which the Babinski phenomenon was present. In the first of these, a man of sixty-three, with slow development of the symptoms, he observed that the excursion of the leg in testing the knee jerk commences with a certain definite value, and

then, upon continued testing, steadily increased. If a pause in the testing was made the excursion returned to the initial value, and again increased. Galvanization of the leg had no effect upon the reflex.

8. *Hematomyelia*.—A man of sixty-eight had loss of the tendon reflexes in the legs, and there was also a complete anesthesia from the level of the tenth dorsal spine. There was paralysis of the bladder and rectum. At the autopsy there was found a bronchial carcinoma in the left lung, with metastasis to various parts of the body. Upon examination of the hardened specimen a huge hemorrhage into the substance of the spinal cord was found, extending from the second dorsal segment to the lumbar region, where it surrounded a metastatic nodule. Below the lumbar region there was diffuse bloody infiltration of the cord. Curiously enough there was no distinct secondary degeneration in the cord, although there was some swelling of the axis cylinders. The blood vessels were normal. It appears, therefore, that the hemorrhage was due to the metastatic nodule.

SAILER.

Allgemeine Zeitschrift für Psychiatrie

(Vol. LXII., 5 and 6, 1905.)

1. Heinrich Laehr. DE GRUYTER.
2. Heinrich Laehr. PELMAN.
3. Symptomatology of Dementia Præcox. ALBRECHT.
4. The Psychology of the Symptom of Rhythmic Accentuation in Insanity. FAUSER.
5. Late Epilepsy in the Course of Chronic Psychoses.
6. Korsakow's Psychosis, with Marked Improvement in the Severe Polyneuritic Symptoms. TEGTMEYER.
7. Contribution to the Clinic of Psychoses in Children. GOTTGRETU.
8. The Relation Between Involution Psychoses and Juvenile Dementia. LOMER.
9. Melancholia and Depression. THALBITZER.
10. The Determination of the Capacity of the Cranial Cavity in the Dead Body. REICHARDT.

1. *Heinrich Laehr*.

2. *Heinrich Laehr*.—Two obituary notices to the late Dr. Laehr, who died at the age of eighty-five years, on Aug. 18, 1905.

3. *Symptomatology of Dementia Præcox*.—The author examining the material admitted to the Treptow Asylum from April, 1900, to April, 1904, finds among 693 admissions, 202 cases of dementia præcox, or 29 per cent. He has chosen these carefully, according to Kraepelin's standards, leaving out all doubtful cases, and gives here an analysis of their time of onset symptoms and termination, grouping them under the three forms, hebephrenia, katatonia and dementia paranoides. His figure, 29 per cent. of total admissions, as against 14 per cent. of total admissions given by Kraepelin, he explains as mainly due to the difference of material in a provincial asylum and in a university clinic, but also partly to racial differences. The percentage for males alone was 28 per cent.; that for females alone 30 per cent. Hereditary tare was present in 56 per cent. of his cases.

As to forms of dementia præcox, there were hebephrenia, 56 cases (30 males, 26 females), or 8 per cent.; katatonia, 64 cases (29 males, 35 females), or 90 per cent.; dementia paranoides, 82 cases (28 males, 44 females), or 12 per cent. An external exciting cause was found in only 4.5 per cent. of his cases. Criminal offences were committed by 18 patients (9 per cent.), 53 per cent. of the cases began before the age of twenty-five years. The onset was marked by depression in 55 per cent. of the cases, by mania in 10 per cent., undetermined in 34 per cent. A depressive first stage was commonest in katatonia, less frequent in dementia paranoides, and rarest in hebephrenia. Few of the cases presented simple mental failure. In the great majority there were more or less pronounced hallu-

cinations, illusions, delusions and katatonic symptoms, and the different forms were shaded off by almost imperceptible degrees into each other. In only 2 per cent. of the cases was there complete recovery. In 17 per cent. there was recovery with defect, 48 per cent. ended in a moderate grade of dementia, 33 per cent. in deep dementia. When recovery occurred it was always within the first year.

4. *Rhythmic Accentuation in Insanity*.—Rhythmic accentuation is present naturally both in man and in the lower animals. In walking we nearly always accentuate—more or less unconsciously—the swing of one foot, on hearing the ticking of a clock, the throbbing of an engine, &c., we accentuate alternate or further removed beats, while in dancing and in playing music we have marked examples of rhythmic accentuation. On the whole the tendency seems a natural and physiological one, which, originating in a voluntary act, has become fixed and hereditary. That rhythmic accentuation is not normally present in speech is due to the fact that we early learn to accentuate according to sense and connection, the natural rhythmic tendency being suppressed by the active exercise of attention and will. Now when attention and will are more or less in abeyance as in certain mental diseases, the natural tendency to rhythmic accentuation is no longer suppressed, but makes its appearance, in the verbigeration, stereotypy, negativism, and automatic movements characterized especially as katatonic. These are hence to be looked upon as symptoms of defective control ("Ausfallsymptome").

5. *Late Epilepsy in Chronic Psychoses*.—While late epilepsy is not in general so rare, the author has found its association with chronic psychoses altogether exceptional, and addressing inquiries to other psychiatrists in Germany and France, learns that their experience in the main coincides with his own. On this account he has collected and analyzes here the histories of 13 cases. Of these, 7 were males, 6 females. The attacks began in one case in the twenty-fourth year, in 13 between 35 and 40, in 2 between 41 and 50, in 4 between 51 and 60, and in 3 beyond the 60th year. While the diagnosis of the original psychosis is not easy to give with certainty, the majority of the cases belonged to the dementia præcox group, especially to the paranoid variety. Two cases were probably periodical psychoses, while one was considered as true paranoia. The first epileptic attack occurred in one case after "several years;" in three, after four or five years; in two, after six to ten years; in four, after ten to fifteen years; in two, after sixteen to twenty years, and in one case, after fifty-seven years. The attacks were infrequent in most cases, though in four cases they occurred in groups of repeated attacks. Status epilepticus, vertigo, or Jacksonian attacks were not met with. The attacks were both light and severe. They were largely nocturnal. Whether the epileptic equivalent was present or not, the author finds it hard to decide, but thinks that it was, in several cases. That the onset of the attacks exercised any seriously deleterious effect upon the psyche, he could not see. Also direct danger to life he finds small as the attacks are in the main infrequent, and status does not occur. As to the pathology of late epilepsy he can say nothing more definite than that it probably depends like ordinary epilepsy on "epileptic brain alteration." Treatment does not differ from that of epilepsy in general.

It will be noted that seven of the author's thirteen cases had passed the fifty-first year. He gives no detailed information as to their physical condition except to mention in one case that the radial arteries were tortuous and that another died of rupture of the heart. This last case coming to autopsy thickening of the Sylvian artery was found while in the only other case, which had died, there was an area of vascular change in the frontal lobe. Senile epilepsy, usually of arteriosclerotic origin, has not been found so very infrequent among the chronic insane in this country.

The author perhaps means to exclude from his consideration this class of cases; but if so, he does not make the fact very clear.

6. *Korsakow's Psychosis*.—After quoting a number of authors as to the scope and clinical picture of Korsakow's psychosis the author reports the case of a man forty years old who after addiction to alcohol for some years, became afflicted with intense polyneuritis affecting chiefly the limbs, which caused him to become bedridden, while at the same time he presented severe mental disturbance characterized by loss of memory, especially for recent events, and tendency to confabulation, disorientation and some loss of power of receiving and storing away impressions. ("Merkfähigkeit.") After a somewhat over two years' stay at the Göttingen Psychiatric Clinic he had so far improved as to be able to walk about and use his arms, only some atrophy of the extensor muscles of the hands and feet and of the small hand muscles persisting. His mental condition had also improved so much that he was oriented, could read the papers, and remember what he had read, and the tendency to confabulation had disappeared. For the period of his illness and the year before that, however, his memory was defective, and he held fast to some of his delusions.

7. *Psychoses in Children*.—Report of a case of severe hallucinosis in a child, probably as a late sequel to a fall with concussion of the brain. The child when he came under observation, was ten years old. The fall had occurred at the age of seven, and the resulting illness had lasted several weeks. During the next year the boy's memory seemed poor, and he made little progress at school, but in the following year his work was again satisfactory. A year later he was noticed to be "often haughty," but the definite outbreak of the psychosis is placed in the following year, over two years and a half after the accident. The child then began to have periods of excitement, with hallucinations of terrifying character, alternating with dullness, ran away from home, climbed on the roof, threatened to jump into the pond and showed such a fondness for playing with fire that two months later he had to be interned at the Roda Asylum. Observation of the case there showed the presence of a varied array of hallucinations of sight, hearing and common sensation, often of a terrifying and threatening character, with periods of excitement, memory defects and tendency to confabulation. At no time were there convulsive attacks or other symptoms of epilepsy. After four months at the asylum recovery, which has lasted for two years.

8. *Involution Psychoses and Juvenile Dementia*.—The author, struck by the identity of certain symptoms observed in the psychoses of the climacteric with those found in dementia præcox, has collected a series of twenty-eight cases, all females, in whom the disease had begun beyond the age of thirty-six years, and gives the result of the analysis of their symptoms. Constructing a curve to show the relative frequency of onset at different ages from thirty-six to sixty, he is struck by the regular rise of figures at four-year periods, beginning at forty-six, and ending at fifty-eight years, states that he has found a similar fluctuation in dementia præcox, and suggests that there may be a rhythmic swell in "physiological pathological function," of whose nature we are ignorant, but which may have to do with periodically increased liability to mental disturbance. Hereditary predisposition was present in only 28.5 per cent. of these patients. Comparing this with his figures for dementia præcox (90.86 per cent.), he suggests, that where heredity is decided, there is early outbreak of the mental disease, while where it is less strong the outbreak may be postponed until the next critical period—the climacteric—43 per cent. of his cases had strong suicidal tendency. The clinical picture was in the main a mixed one. In twenty of the twenty-eight cases there was a strong sexual element shown by talk, hallucinations and delusions. There was refusal of food in ten cases, negativism and mutism in eleven cases, verbigeration and stereotypy in ten cases. Hebephrenic and paranoid symptoms were observed in a few

instances. All of these cases proceeded more or less rapidly to dementia, some within a year. Considering the prominence of sexual symptoms the author thinks the involution psychosis probably due to a "pathologically altered internal secretion of the sexual glands." He has already in another article expressed a similar view as to the causation of dementia præcox.

9. *Melancholia and Depression*.—A criticism of Kraepelin's position in classifying melancholia as a special involution psychosis to be distinguished from the depression of manic depressive insanity, from which latter group the author thinks its separation is not justified by the facts at our disposal. For a fuller statement of his position he refers to a work, "The Manic-Depressive Psychosis," published by him (in Danish) in 1902.

10. *Capacity of the Cranial Cavity*.—According to this author, brain weight alone without determining its relation to the capacity of the skull gives insufficient information upon which to base an opinion as to pathological processes.

From a number of examinations he has found that normally the skull capacity in cubic centimeters is 12 to 14 per cent. greater than the weight in grammes of the brain, and has accustomed himself to consider a difference of 20 per cent. or over between skull capacity and brain weight as indicating pathologically low weight, while conversely a difference of 5 per cent. or less indicates pathologically excessive weight of the brain. The brain may at times become actually enlarged, gaining as much as 200 grms. without noticeable edema, and the author thinks that there is ample ground for believing that this enlargement may play a rôle in epileptic attacks, sunstroke, concussion of the brain, and in some cases of sudden death of persons apparently in full health. On this account, not only in nervous and mental diseases, but in all important autopsies, both accurate brain weighing and measuring the capacity of the skull should be a routine procedure. As a simple, quick and fairly accurate process he recommends the following:

The most important step is the sawing of the skull accurately in a horizontal plane, best in that passing about 2 cm. above the root of the nose, and the same distance above the external occipital protuberance. This can be laid off on the skull after separation of the soft parts by application of a steel band fastened by a suitable clamp, and can be marked in paint or pencil and accurately followed by the saw, the body being turned as needed. The brain is removed as usual, the medulla being cut at the pyramidal decussation, the dura removed from the posterior fossa, avoiding injuring its attachments around the foramen magnum. The skull is then placed so that its base is in a horizontal plane, and a little water being poured into it, more is added from time to time, until the level of the liquid in the foramen magnum remains constant. The skull is then filled with water, this allowed to settle, emptied quickly and filled again from a measuring cylinder, the quantity needed being read off each time. In order to get an accurate figure this should be repeated from six to ten times, or until the reading is constant. The calvarium is placed on a tripod levelled, and its capacity measured in the same way. The two figures obtained added together give the capacity of the skull in c. c. Should leakage through the foramina persist they may be plugged with non-absorbent cotton. The author has found this method accurate to within 50c.c. He thinks that statements as to brain atrophy are of little value without determination of the relation between brain weight and skull capacity, and calls attention to the fact that in paretics especially there is often microcephaly, though he has also found in this disease a difference of as much as 40 per cent. between brain weight and skull capacity. Careful mensuration and weighing consistently carried out may also, he thinks, give important information upon the subject of intracranial pressure.

ALLEN (Trenton).

Journal de Neurologie

(Vol. X., Nos. 19, 20, 21, 1905.)

These numbers are devoted to the proceedings of the First Belgian Congress of Neurology and Psychiatry. Of interest, and published in full, are:

1. Neurasthenia Among the Working Classes. GLORIEAUX.
2. Algogenic Substances. IOTEYKO.
3. The Sense of Pain. IOTEYKO.

1. *Neurasthenia Among the Working Classes.*—Calling attention to the relatively small number of articles on this particular subject the author quotes the statements of certain Scandinavian physicians as to the frequency of neurasthenia among the peasants and fisher-folk, of their countries, also from an article by Leubuscher and Bibrowicz on the frequency of neurasthenia among the workers of Berlin. He then gives the results of his own experience at the Brussels Polyclinic. Among 9,981 cases of nervous disease—those of rheumatic origin, and children under twelve years old being excluded—he found 1,671 cases of neurasthenia, 803 in the male, 868 in the female; *i. e.*, 16.7 per cent. Although confessing to some imperfections in the records as to the occupations of his patients, he is struck by the frequency of neurasthenia among the following: Housewives, 306 times; tailoresses, milliners and seamstresses, 189 times.

The average number of cases of neurasthenia among working people he finds 17.5 per cent. for males and 16 per cent. for females. His statistics as to the occupations of these patients are as follows:

Males: Employees, 13.5 per cent.; joiners, 7.0 per cent.; shoemakers, 4.7 per cent.; tailors, 4.2 per cent.; painters, 3.5 per cent.; printers, 2.5 per cent.; railroad men, 5.0 per cent.; various, 50.6 per cent.

Females: Housewives, 30.0 per cent.; tailoresses, milliners and seamstresses, 20.6 per cent.; servants, 5.0 per cent.; laundresses, 2.0 per cent.; governesses, 2.0 per cent.; shop girls, 1.0 per cent.; various, 39.4 per cent.

He does not regard the neurasthenia in these cases as being due as much to overwork as to confinement, bad hygienic surroundings and monotony, and calls special attention to the frequency of the disease among housewives in whom the element of worry about making ends meet and monotony must play a particular rôle. He does not find, however, that neurasthenia is increasing among the Belgian working people, and with improving knowledge of hygiene, and laws enforcing the application of its principles to factories, etc., he is hopeful for the future.

2. *Algogenic Substances.*—In this the authoress expresses her view that the production of pain is due to the action on the nerves or their terminations of certain toxic substances; in other words, that the excitant is always a chemical one. She quotes various authorities and gives her own ideas, but does not pretend to say what the nature of the poison may be.

3. *The Sense of Pain.*—In a voluminous report, which is published in extenso, this subject is discussed under the following chapters: Generalities on the Senses, and the Law of the Specific Energy of Sensorial Organs. Chapter I. The Excitement of Pain. II. Algometry, Topography of Pain. III. Peripheral Organs of Pain. IV. Paths of Conduction and Supposed Centers of Pain. V. Dolorific Asymmetry. VI. Dissociations, Analgesia. VII. Signs of Pain (Physical Concomitants). VIII. Pain as Influenced by Age, Race and Profession, and in Pathological States, Pain in Animals. IX. Some Physiological and Psychological Characters of Pain. X. Biological Theory of Pain, Its Phylectric Rôle.

At the start the authoress affirms her belief that there are special and separate nerves for the senses of pain, touch, heat and cold. She reviews at some length, especially in her third chapter, the work of various experimenters whose results seem to support this view of the matter.

Under "Algometry" she speaks of the various methods of measuring

sense of pain, and describes the algesimeter of Cheron, of which she has made use in her own experiments. She is inclined to think that the perception of pain takes place in different centers from the perception of other sensations. Under "Dolorific Asymmetry" she gives a sketch of some already published experiments of herself and Mlle. Stefanowska, which showed that in a large proportion of subjects, the acuity of the pain sense is greater on the left side than on the right, in the proportion of 10 to 9, figures agreeing closely with those found by Van Biervliet.

Under the dissociations she discusses those observed in organic and those in functional diseases, especially in hysteria, and as a result of the administration of anesthetics, both general and local. In Chapter VII., the physiognomy of pain, and its influence upon the muscular system, the heart and other organs is considered at length. In Chapter VIII., the results of a large number of experiments on sensitiveness to pain, as observed according to race, age, sex and profession, are exposed. Their comparison seems to show women are more sensitive to pain than men, but nevertheless bear it better (a fact long known), and that savage races are less sensitive to pain than civilized ones. Pain in animals is also considered here. The physiology (or pathology) and psychology of pain are next taken up; and lastly, the biological theory of its origin is discussed. The authoress concludes that its rôle is in the end protective, and that it must be numbered among the defenses of the organism. An extensive bibliography is appended.

(Vol. X., No. 22, 1905.)

1. The Nucleolus of the Nerve Cell, Morphology. LACHO.

1. *The Nucleolus of the Nerve Cell, Morphology.*—In the human subject in the great majority of cases there is only one nucleolus to a nerve cell, though there may be occasionally as many as four even. In the lower animals, especially in those of early age, it is not so infrequently double, more rarely triple. The diameter of the nucleolus averages one-third that of the nucleus. The author finds it to consist of two elements, an incolorable framework, or basement substance, and chromatic particles. It is developed from a particle of the chromatic substance of the nucleus. The nucleolus possesses great firmness and power of resistance, remaining little altered in cell preparations made by crushing a particle of nervous tissue between two slides. The chromatic substance seems augmented in irritative conditions, diminished in hibernating animals and in certain pathological conditions in man. It also shows variations in its distribution. While the nucleolus usually stains deeply, under certain circumstances it shows what have been considered as vacuoles, but what the author thinks are not empty spaces, but composed of a non-staining, highly refractile substance. These are not brought out in the Nissl staining method, but require a special safranine stain. On their presence the author lays some stress. Also there are some points which take the stain more intensely, hyperchromatic points. The nucleolus is usually described as basophile, but the author does not find this absolute, as it takes also some of the acid colors. In birds especially, he finds two nucleoli in the nerve cells, the one chromatic, the other achromatic. The chromatic nucleolus is the principal one; the other, an accessory nucleus, is scarcely perceptible by the Nissl method, but is colored faintly by safranine. The binucleolar condition is also observed in the nerve cells of reptiles, but the author has failed to find it in batrachians.

(Vol. X., No. 23, 1905.)

1. The Evolution of Hypochondriacal States. TATY and CHAUMIER.

1. *Hypochondriacal States.*—The authors give in outline the histories of ten cases of insane hypochondriasis, which they were able to follow from evolution to termination in cure, death or dementia. Eight of the subjects died, one recovered, and one remains alive, demented, at an advanced age.

The trouble first appeared at different ages, ranging from sixteen to sixty-two years. They lay special stress upon the necessity for thorough and repeated examination for underlying physical disease, which is present in the majority of cases, and emphasize the importance of guarding against suicide, a by no means infrequent termination, two of their cases having ended in this way.

(Vol. X., No. 24, 1905.)

I. Hysterical Tic. PITRES and CRUCHET.

1. *Hysterical Tic*.—As to the presence of tic in hysteria, there seems to be some confusion, many authors denying that there is a tic of hysterical origin.

Pitres and Cruchet classify the conditions under which tic-like movements are observed in hysteria, as follows: 1. Certain spasms essentially rhythmic, and having a particular character, which are not, however, true tics. 2. True tics which, appearing in the course of hysteria, are added to a pre-existent or concomitant disease and persist in association with it, but should nevertheless not be considered as true hysterical phenomena. 3. There remains a third group of cases, which comprise true hysterical tics, special clinical manifestations of hysteria. From a certain number of personally observed cases they select two as illustrative. The first is that of a woman of thirty years of age, who, in addition to other hysterical manifestations, presented convulsive tic of the shoulder, neck and face, which was cured by hypnotic suggestion. The second is that of a girl fourteen and a half years old who presented convulsive crises and hiccough coming on at the same hour every day for a month. These crises were eventually replaced by tic of the shoulders, head and face, occurring similarly at the same hour every day, and lasting six months. Sudden cure coincided with the return of menstruation to normal. The authors regard both of these cases as examples of true hysterical tic. One of them (P.) had previously called attention to the modifying influence upon tic in general, of directing the attention of the patient to the performance of certain delicate movements, as writing, sewing, etc. The movements in the above cases, however, were in no way influenced by such exercises.

ALLEN (Trenton).

Archiv für Psychiatrie und Nervenkrankheiten

(Vol. 40, Part 2.)

13. Experiments on Brain Transplantation. SALTYKOW.
14. A Contribution to the Pathology of Tabes. SPEILMEYER.
15. Hematomyelia and Syringomyelia. KÖLPIN.
16. The Feeling of Vibration of the Skin. TREITEL.
17. A Contribution to the Pathological Anatomy of Landry's Paralysis. LOHRISCH.
18. The Psychopathology of Sexual Perversion. DONATH.
19. The Paralysis of Pregnancy of the Mother. VON HÖSSLIN.
20. Contribution to the Pathological Anatomy of Pseudo-Bulbar Paralysis. MÜLLER.
21. Observations on Color Hearing (auditio colorata). LOMER.
22. On Affection of the Ventral Horns in Tabes Dorsalis. LAPINSKY.

13. *Brain Transplantation*.—In this paper Saltykow gives the results of his experimental investigation in the transplanting of portions of the brain. The general conclusions reached are as follows: Brain tissue may easily be transplanted. The transplanted portion does not undergo softening as might be expected, but heals as any other tissue. The cellular elements of the transplanted tissue are in part preserved for a certain time, but later show progressive degenerative changes leading ultimately to their destruction. Well preserved ganglion cells may be observed up to the

eighth day, but changes begin after the eighth hour. Glia cells show mitoses on the seventh day, continuing in decreasing number up to the twentieth day. The blood vessels of the transplanted tissue show from the second to the third day vigorous mitotic changes in the endothelium and the perivascular cells. The blood vessels, with other new formed vessels, remain. The nerve fibers degenerate and quickly disappear. The tissue surrounding the transplanted portion increases in extent and gradually replaces the foreign tissue. Outside of the connective tissue scar a sclerotic glia zone is formed. In the neighborhood of the wound numerous ganglion cell mitoses may be observed, likewise new formed nerve fibers. The opinion is finally expressed that fat granule cells originate from perivascular cells and other connective tissue cells.

14. *Tabes*.—Speilmeyer, by the use of special methods in the study of the pathological anatomy of tabes, finds, employing Cajal's axis cylinder method, that the terminations of the neurones show a loss of fibers, particularly of the non-medullated sort. These changes are particularly well shown in Clarke's columns and in the nuclei of the posterior columns. Glia preparations show an accompanying growth of the glia in those places where the posterior fibers have been destroyed. A further study of the glia in degenerated areas showed that static conditions determined the arrangement of the fibers, and that they were not alone dependent upon the direction of the degenerated nerve fibers. Changes were also found in the cerebellum.

15. *Hematomyelia and Syringomyelia*.—Kölpin narrates at length a case bearing upon the pathogenesis of syringomyelia and concludes from its study that a syringomyelia may originate from a hematomyelia. In this case at least he thinks it altogether probable that there is positive connection between hematomyelia and syringomyelia; or, in other words, that syringomyelia may be of traumatic origin.

16. *Feeling of Vibration of the Skin*.—Treitel contributes a short paper on his study of the feeling of vibration of the skin. He finds that disturbances of the feeling of vibration appear earlier than disturbance of the pain or contact sense. The exact nature of the sense of vibration is still somewhat in doubt, but Treitel asserts that the assumption of Egger and Dejerine that the organs, and especially the bones, constitute its substratum is wrong, inasmuch as the feeling of vibration is as marked in parts of the body where bones are well covered with muscles, or even in parts wholly without bone. The sign should be of value in the study of tabes and also in neuritis, multiple sclerosis and syringomyelia, in all of which the sense of vibration is disturbed.

17. *Landry's Paralysis*.—Lohrlich reports a case of a patient suffering from tabes who died with the symptoms of Landry's paralysis after an illness of eight days. The question is discussed as to the propriety of considering the disease Landry's paralysis. Post-mortem, typical lesions of tabes were found, and in addition acute disease of the gray matter in all parts of the spinal cord and oblongata characterized by hemorrhage, disappearance of myeline and ganglion cell degeneration. The disease, therefore, histologically, was an acute disseminated poliomyelitis. The discussion of the case adds little new and the literature has not been thoroughly studied.

18. *Sexual Perversion*.—In his paper on the psychopathology of sexual perversion Donath describes the case of a youth suffering from a mixed form of ideal masochism with sadism, or, in short, algolagnia on congenital basis. The case should be of interest to those studying perversion in its unusual forms.

19. *Paralysis of Pregnancy*.—This paper concludes von Hösslin's elaborate study on the paralyzes of pregnancy. It is a monographic consideration of the entire subject, and as such does not permit of brief review. It is the hope of the author that the study will offer a certain explanation of the relationship between pregnancy and certain forms of

paralysis, particularly those apparently due to toxines produced within the body.

20. *Pseudo-Bulbar Paralysis*.—On the basis of one case Müller discusses the question of the pathological anatomy of pseudo-bulbar paralysis. As the result of the pathological investigation he found the cause of the symptoms to lie in the presence of several large areas of softening in the brain, together with others in the pons, oblongata and spinal cord. The clinical course of the disease had lasted for twenty years, hence a difficulty of bringing into close relationship the symptoms observed during life and the post-mortem lesions. The case is discussed in an interesting way, and is an addition to our knowledge of what is rightly called pseudo-bulbar paralysis.

21. *Color Hearing*.—By color hearing is understood the existence of subjective appearance of color during the appreciation of tones and sounds of various sort. This condition is not extremely rare, inasmuch as up to the year 1896, 140 cases had been published, particularly by French and Italian authors. Since then a number of cases have also been reported. The article concerns itself with a technical description of the physical and psychological processes involved, and the conclusion is reached that color hearing is an accidental syndrome occurring at a certain level of intelligence, which in itself is not pathological, but in certain cases may be an accompanying phenomenon of dissolution.

2. *Ventral Horns in Tabes Dorsalis*.—Continued article.

Revista di Patologia Nervosa e Mentale

(May, 1905.)

1. Experimental Contribution to the Study of the Subjective Phenomena of Fatigue in Voluntary Work. Z. TREVES.
2. The Structure of the Retina. RENATO REBIZZI.

1. *Fatigue in Voluntary Work*.—The muscles and the nervous system constitute the organs involved in voluntary work. Both collaborate in all cases. The method used heretofore in studying voluntary work has been the method of the ergograph, but this instrument has as yet yielded only results of doubtful value.

The capacity for voluntary work results from two factors. 1. The total quantity of work the muscles are in condition to furnish. 2. The strength of the initial stimulus. The author discusses at length the work of Kræpelin and the conclusion he arrived at in his "Die Arbeitscurve." He disagrees with Kraepelin and takes up the theories of Lehmann, Loeb, Sherrington and James. He concludes from this study that all authors who have studied the influence of the psychic state in the course of voluntary work put in evidence a lot of conditions which lessen the effects of voluntary work and they do not know how to describe that with the attributes of attention, sometimes comparing it directly and sometimes confounding it with them in another sense.

According to James the effort of attention is the essential phenomenon of the will; so the muscular effort implies volition, so in ultimate analysis all the psychical attributes (precision, &c.) of a voluntary movement may be the expression of the degree of attention that determines it. The force of the accelerating function one may consider then as the measure of the general tone of attention; and as much one would be obliged to say of the impulse (*antrieb*) to voluntary work. The oscillation of the acceleration of voluntary movements and of the *antrieb* of mental work, which occurs as well as one is able to say, outside the consciousness of the subject, until the organs regain a sufficient amount of energy, may be the index of the oscillation of attention.

And the long periods of depression that one observes in the acceleration and in the *antrieb* may correspond to various grades of that rise of

attention (with the supervening of psychic inertia) that one feels in himself as the effects of fatigue and monotonous mechanical occupations that ends by becoming quasi automatic.

2. *Structure of the Retina*.—An article on the histology of the retina. The method of Lugaro was used in the study—colloid silver with additions of gold for the staining of the neurofibrils.

(June, 1905.)

1. The Pathogenic Mechanism of Spasmodic Laughter and Crying, and the Motor Functions of the Lenticular Nucleus. FRANCESCHI.

2. The Structure of the Axis-Cylinder. LUGARO.

3. Localization of the Nucleus of the Facial in Man. PURBON and PAPINIAN.

1. *Mechanism of Laughter and Spasmodic Crying*.—A detailed study of the post-mortem findings in a case with a discussion of the histological possibilities opened up by the lesions.

2. *Structure of Axis-Cylinder*.—A purely anatomical article.

3. *Localization of the Nucleus of the Facial*.—A detailed study of a case presenting facial paralysis due to a cancerous tumor of the buccal mucosa and occupying the mid-portion of the face. Serial sections of the facial nucleus were studied and an attempt made to show which cells presided over the individual muscles. WHITE.

(July, 1905.)

1. A Special Nuclear Alteration in Rabies. SICILIANO.

2. Researches on the Fibrillar Structure of the Nerve Cells in Normal Conditions and After Lesions of the Nerves. PARIANI.

3. Contribution to the Pathogenesis of Experimental Pneumococcal Paralysis. PANICHI.

1. *Nuclear Alteration in Rabies*.—The attention of the author was directed to the cornu Ammonis in rabies by the works of Negri. He himself was struck by certain special nuclear changes in the cornu Ammonis of a rabbit dead from rabies; Biondi's triacid stain proved very useful in studying these changes. The change seemed to be of the nature of a regressive process; the nucleus contracted, assumed diverse forms and contained increased nuclein either scattered in granules or concentrated in one large drop. While the nucleolus is pink, the nuclein granules are green with Biondi's stain. The nuclear membrane disappears, and the unclear clump is surrounded by a clear space, and by some protoplasm in the periphery. The author proposes to study the question whether these changes are peculiar to rabies or represent a special reaction of the cells of the cornu Ammonis.

2. *Fibrillar Structure of the Nerve Cell*.—The author studied by the use of neurofibrillar methods the changes in the anterior horn cells and in the cells of the spinal ganglia of a dog after resection and twisting of the sciatic nerve. He used mainly the methods of Lugaro and Donaggio, and also that of Cajal. In the main the different methods gave the same result; the neurofibrils in the part of the cell where the axonal reaction showed the greatest changes were the first to disappear and showed a sort of powdery disintegration; the neurofibrils of the periphery of the cell persisted longer. The changes as seen in a neurofibril preparation are parallel in time and manner to those of axonal reaction as shown by the method of Nissl.

3. *Experimental Pneumococcal Paralysis*.—Panichi gives the result of experimental work on the action of the pneumococcal virus on rabbits. Three rabbits died within twelve or thirteen hours after the injection, presenting convulsions, but no spastic paralysis. In the cord the nerve cells were the elements most affected, showing changes at every level, but not all the cells being affected. Changes in the vessels were slight, hemorrhage

was exceptional. Six rabbits presented spastic paralysis of the limbs and lived a considerable time. The cord in these cases showed similar cell changes to those observed in the acute cases, but in addition hemorrhage was an almost constant feature. The vessel walls showed proliferative changes. The hemorrhages occurred most frequently in the dorsal region, least frequently in the cervical; gray and white matter were both affected. These late hemorrhages bring the pneumococcal process into line with typhoid and grippe. The paralyzes are due to the hemorrhages and not to the direct action of the toxin on the nerve cells.

(August, 1905.)

1. The Neurofibrillar Reticulum of the Motor Cells of the Spinal Cord in Tetanus in Animals. TIBERTI.
2. Two Familial Cases of Cerebellospinal Ataxia (Friedreich's Type?) Presenting Some Rare Features. CERLETTI and PERUSINI.
3. Notes on the Pathological Histology (by Biopsy) of the Striated Muscle Fiber in Parkinson's Disease. SALARIS.

1. *Motor Cells of the Spinal Cord in Tetanus in Animals.*—Using the methods of Donaggio and Cajal the author was unable, in animals treated with injections of tetanus toxin, to demonstrate any appreciable lesions of the neurofibrillar reticulum of the motor cells of the cord. There was in some cases slight thickening of the neurofibrils, which is, however, a banal condition. His results are in striking contrast with those of Marinesco, who claims to have demonstrated in tetanus marked neurofibrillar disintegration.

2. *Cerebellospinal Ataxia.*—The authors' report in detail the cases of a brother and sister, aged 21 and 25, respectively, who in childhood developed a marked disorder of gait and a series of clinical symptoms which formed a picture closely related to that of Friedreich's ataxia. The onset in both cases was slow and insidious. When the disease had fully established itself both patients presented static and dynamic ataxia, marked speech defect, the speech being slow and monotonous, constant rotatory nystagmus, deformity of the feet, presence of light reflex, absence of lightning pains.

Of special interest were the rotatory nystagmus, the presence in the boy of mitral stenosis, the presence in both of the patellar reflexes, and in the case of the girl of grave mental defects, with rectal and vesical troubles, while the boy had partial paralysis of both external recti.

The authors discuss the importance of these symptoms in the diagnosis of Friedreich's ataxia, Marie's *heredoataxie cerebelleuse*, and the whole series of obscure spinal affections which enter into the same large group as these two forms. The views of other authors are given, and a fair idea is presented of the present confused state of our knowledge of the clinical and pathological features of the whole group.

A bibliography of 68 references is appended to the article.

3. *The Striated Muscle Fibre in Parkinson's Disease.*—The author reports the results of his examination of one case. The nuclei of the sarcolemma were found normal, the muscle fibre presented an appearance similar to that of cloudy swelling. Both the transverse and longitudinal striation were interfered with. The perimysium and the endomysium showed nothing abnormal.

C. MACFIE CAMPBELL.

Psychiatrisch-Neurologische Wochenschrift

(Sept. 23, 1905.)

1. Forms of Chronic Dementia, with Preceding Psychomotor Disturbances. ОТАН.

Many of the psychoses present psychomotor disturbances. Paresis and senile dementia in particular, while lately there has been separated

out of this group arteriosclerotic dementia. Kraepelin says of this, however, that arteriosclerosis may complicate various psychotic pictures, but that we do not now seek for a given brain disease corresponding to certain psychotic appearances, but turn from a clinically individualized symptom-complex for an anatomical interpretation.

The most important symptoms observed were: A great falling off in the ability to work, a functional weakness in certain motor zones. Isolated paralyses with slight disturbances of spoken and written words, especially after physical exertion, alcohol or "bad day." Another symptom is irritability of the vaso-motor system. In the fifth decade appears a functional defect in social deportment; an important differential symptom from paresis. While in paresis the defect in social feeling is permanent, here it shows itself by suggestions and forerunners, coming and going. Later only permanent traces remain. Even the bodily symptoms of senium præcox appear in groups, and then the condition perhaps for years remains stationary. Early or later appear change of mood, hypomaniacal unrest, pressure of activity, insomnia. This condition is transitory, giving the appearance to the whole course of the disease of recoverability. Slight motor disturbances appear, clumsiness of an extremity, uncertain gait. The patient makes false steps and falls. Aphasia and agraphic symptoms appear, also dysarthria, which, however, does not remind us of paresis. Pupillary reaction good. Knee jerks normal.

The patient becomes a typical asylum inmate. In the now rapid course occurs change of mood, home-sickness or on the contrary, euphoria, with erotic coloring. The course is then rapidly downward; becomes filthy with a tendency to decubitus. Death usually follows a sudden increase in severity of the symptoms, with signs of a hypostatic pneumonia. The author has never observed death from apoplexy.

(Sept. 30, 1905.)

1. Anhalonium Lewinii. JOHANNES BRESLER.

This article is a study of the physiological effects of anhalonium. The author believes the drug has great value in experimental psychology, especially in the field of optics, and may have value in the realm of nervous and mental diseases. Its use might detect simulation; for instance, if a patient twenty-four hours or later stated he had visions this would condemn him.

(Oct. 7, 1905.)

1. The Chemnitz Hospital for Nervous Diseases. EMIL HÜFLER.

2. Three Cases of Number Obsessions. ALF. ADLER.

1. *The Chemnitz Hospital*.—An illustrated description of the hospital.

2. In his "Psychopathologie des Alltagslebens" (psychopathology of everyday life) Freud, among other things, has noted that a thoughtlessly hinted at number may act as a determinant. He calls attention in this connection to the depth in the mental life the analysis of such a number reaches. The three examples given are of persons who have a constant tendency to reduce everything to certain numbers. Case II. Name Otto, observes that his name reads the same forward or backwards, it has four letters ($2 \times 2 = 2 + 2$), the two syllables are the same, it reminds him of the expression $2 \times 2 = 2 + 2$, it is determined by fate. His birthday is the 22nd, $2 \times 2 = 2 + 2$, whatever he undertakes, the result is the same, he cannot struggle against fate.

The sense and object of this reducing the numbers is obviously a necessity on the part of the "psyche" for a compromise. In none of the cases cited do we find a full suppression of psychic material from consciousness, in none either a full tolerance on the part of the consciousness for the respective ideas.

WHITE.

A HUMAN CEREBRUM WITHOUT A COMMISSURE THAT APPARENTLY PERFORMED NORMAL FUNCTIONS. Arturo Banchi (Archivio di Fisiologia, July, 1904).

A woman, seventy-three years of age, died of heart disease without having presented the slightest evidence of any trouble in the central nervous system. Her cerebrum, normal in every other respect, had not a single commissure between the two hemispheres. The corpus callosum, anterior commissure, etc., were completely absent. In certain conditions, therefore, it appears that the intrahemispherical associations may take the place of the interhemispherical. This hypothesis would seem to be confirmed, histologically by the development of a system of association fibers in the median longitudinal fasciculus. This fasciculus is made up in part of the fibres of the long fornix, existing normally in man, and in part of sagittal fibres of association which normally pass unperceived because of their scarcity and disassociation.

METTLER (Chicago).

THE RESULTS OF OPERATION FOR THE REMOVAL OF CEREBRAL TUMOR. Philip Coombs Knapp. (Boston Medical and Surgical Journal, cliv., 124, Feb. 1, 1906.)

Dr. Knapp presented the statistics of 828 cases, including further unpublished cases, on which an operation for removal of tumor of the brain was performed. In 471 of these cases the tumor was wholly or partly removed; 128 of these patients died as the result of operation, and 78 were not benefited. In 189 cases the tumor was not found at the point of operation. In 64 cases it was impossible to remove it, and in 104 cases the operation was for the relief of pressure. Of the whole 828 cases, 265 patients died as the result of operation, and 186 were not improved. One hundred and sixteen patients were classed as recovered, but the cases of actual complete restoration to health were regarded as exceedingly rare.

A comparison of four of the statistics of operation collected by the writer on four different occasions in 1889, 1891, 1899 and 1905, showed that there had been a diminution in the mortality and an increase in the number of patients benefited, due to the improvement in surgical technique. The percentage of failures to remove the tumor largely on account of incorrect diagnosis, showed comparatively little gain. The palliative operation for the relief of headache and optic neuritis by relieving intra-cranial pressure was often unsuccessful. These symptoms were perhaps of toxic origin.

THE MENTAL SYMPTOMS OF CEREBRAL TUMOR. Philip Coombs Knapp. (Boston Medical and Surgical Journal, cliv., 361, April 5, 1906, 132. Brain, xxix., 35, April, 1906.)

Dr. Knapp had made a study of the mental symptoms in 104 cases of tumor of the brain with autopsy observed at the Boston City Hospital. Mental disturbances were noted in 79 cases. Forty cases, however, were excluded on account of complicating diseases and for other reasons. In the remaining 64 cases mental symptoms were noted 58 times, and the writer believed that such disturbances were far more frequent than had been previously stated.

The mental symptoms were observed early in the progress of the disease in 28 cases. The nature of the mental disturbances varied. The largest number of cases, 31 in all, showed simple mental failure and dullness. Seven cases showed marked mental confusion and 15 cases actual delirium. One patient was simply neurasthenic, two had delusions of persecution, one was depressed, another showed symptoms of general paralysis. The special Witzelsucht so often described was not observed. The states of delirium were more apt to be noted in the later stages of the disease. The writer found that a tumor on the left side of the brain was not more apt to produce mental symptoms than a tumor on the right.

In regard to the location of the growth, in the only case of a tumor of the cerebrum in which mental symptoms were not noted, the tumor was in the frontal lobe. The writer, however, believed that the frontal and temporal lobes were more especially to be regarded as presiding over the higher psychical functions. The mental symptoms seemed less, probably the result of a lesion in a definite portion of the brain than the result of general processes such as pressure and the formation of toxins. The nature of the mental disturbances suggested a toxic origin, and in one case they developed after an attempt at removal of the tumor had relieved the increased intra-cranial pressure.

SURGICAL INTERVENTION IN TUBERCULOSIS OF THE MENINGES AND OF THE BRAIN. By Roberto Alessandri (*Annal. of Surg.*, February, 1906).

In an exhaustive résumé of this subject there are distinguished tuberculous meningitis and the solitary tubercle of the brain, since the two varieties, though merging one into the other, are very distinct in their typical forms, and the possibility and results of surgical intervention must be considered separately. Tuberculous processes of the meninges sometimes heal spontaneously, and in the greater number of cases the resort to surgery is not to be advised. The operations with decompressive scope have for the most part only a temporary value. Lumbar puncture is the operation of preference, on account also of its high diagnostic value. In some rare forms of meningitis in plaques, of meningitis of chronic course with localizations upon the meningeal vault, or in the consequences of a localized and healed process, active surgical intervention is to be considered. In solitary tubercle of the brain there can be a question of surgery in only a small number of cases, even when it is a matter of a limited lesion, and this by reason of the ordinary site, the frequent complication with meningitis, their multiplicity, the presence of other serious tuberculous lesions in other organs of the body. In any case to allow of intervention the essential point is that the precise seat of the lesion be diagnosed and that this seat be surgically accessible. The possibility of relative spontaneous cure should always be borne in mind. Given the limitations to indication for operating, the results for the cerebrum are fairly good. In 19 out of 22 cases operated the result of the operation was favorable, though in some of the cases the amelioration was very little or none at all. Statistics for the cerebellum are more discouraging. In six cases in which the lesion was found and removed four cases were immediately followed by death, and the two others had only a transitory amelioration, since death took place after two months and a half in one case, and after ten months in the most favorable case.

JELLIFFE.

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Original Articles

THE SUBDIVISION OF THE REPRESENTATION OF CUTANEOUS AND MUSCULAR SENSIBILITY AND OF STEREOGNOSIS IN THE CEREBRAL CORTEX.*

BY CHARLES K. MILLS, M.D.,
OF PHILADELPHIA.

PROFESSOR OF NEUROLOGY IN THE UNIVERSITY OF PENNSYLVANIA; NEUROLOGIST TO THE PHILADELPHIA GENERAL HOSPITAL, AND CONSULTANT TO THE PHILADELPHIA ORTHOPEDIC HOSPITAL AND INFIRMARY FOR NERVOUS DISEASES.

AND

T. H. WEISENBURG, M.D.,
OF PHILADELPHIA.

INSTRUCTOR IN NEUROLOGY AND IN NEUROPATHOLOGY IN THE UNIVERSITY OF PENNSYLVANIA, AND ASSISTANT NEUROLOGIST TO THE PHILADELPHIA GENERAL HOSPITAL.

The main object of the present contribution is to present the following propositions: (1) that the cortical representation of cutaneous and muscular sensibility is independent of motor representation, that it surrounds the motor zone, and that it is subdivided into a mosaic of centres, each centre or group of centres being anatomically and functionally correlated to a motor centre or centres; (2) that every muscle or group of muscles producing a movement or movements which are represented by separate centres in the cortex is topographically related to a segment of the skin which has also a definite cortical centre, this centre being correlated anatomically and functionally with the motor centre; (3) that stereognostic representation like that of cutaneous and muscular sensibility and of movements has also its independent

*Read before the American Neurological Association, Boston, Mass., June 4, 1906.

cortical area, and is subdivided after the manner of the motor and sensory areas.

It will be seen that according to the above propositions, the representation of cutaneous and muscular sensibility and stereognosis is not only for the face, arm, trunk, and leg, but for subdivisions of these parts.

The acceptance of the view that the motor zone is entirely cephalad of the central fissure gives a position of advantage in discussing the question both of separate motor and sensory representation and of the subdivisions of the latter. Those who believe that the cortical motor and sensory areas are identical have until recently been in the majority, but the weight of opinion is now in favor of the separatists.

The writers accept without qualification the view that the motor area is cephalad of the central fissure. One of them (Dr. Mills) has been a consistent advocate of separate motor and sensory representation. As early as 1888 he attributed sensory functions to the parietal lobe, and also in several publications (1888, 1895 and 1904)¹ expressed the view that the cortical sensory area was subdivided into centres in a manner similar to the subdivision of the motor area.

The following quotation from the paper published in 1904 gives his views as then expressed:

"It is probable that the areas of representation of cutaneous and muscular sensibility are subdivided in a manner analogous to the subdivision of the motor area, in other words, for the face, head, neck, upper extremity, trunk, lower extremity and other parts of the body, and that even some of these areas contain sub-areas and centres. As indicated diagrammatically, the cutaneous-muscular sensory area encircles on all sides the great motor area on the lateral aspect of the hemispheres, occupying the post-central convolution and the anterior extremities of the superior and inferior parietal gyri or lobules, and on the mesal aspect the more posterior and inferior portions of the paracentral and frontomarginal gyri, and the contiguous parts of the precuneus and gyrus fornicatus. The sensory areas for the face, head, neck, upper extremity, trunk, lower extremity, etc., occupy respectively areas adjoining the subdivisions of the motor cortex representing these parts of the body; in other words, that the areas and sub-areas of representation of the movements of the larynx, jaws and

face should be toward the lowermost portion of the postcentral and postparietal convolutions, the areas for the head and neck, upper extremity, and trunk coming next in order from below upward, while on the lateral edge of the hemisphere and on its mesal aspect are centres for the lower extremity, anus, genitalia, and viscera. Clinicopathologic, experimental and psychologic facts can be adduced in support of these localizations. Studies in hypnosis, and in hysteria and of the sensory aura of Jacksonian epilepsy point in the same direction. A considerable number of cases of limited cortical or of subcortical lesion have been recorded in which the anesthesia has been circumscribed to a limb or the face or trunk, or to special portions of these larger divisions of the body. The well-known experiments of Horsley and Schäfer also showed that circumscribed areas of anesthesia sometimes resulted from experimental lesions of the limbic lobe. Grünbaum and Sherrington, in their experiments on the higher anthropoids, demonstrated that certain segments of the non-excitabile postcentral convolutions were distinctly related to particular subdivisions of the precentral motor cortex. Faradization of portions of the cortex of the postcentral convolution, while not calling out motor response, facilitated this response in portions of the precentral convolution at the same horizontal level. This is a fact pregnant with suggestion."

At a meeting of the American Neurological Association, held in St. Louis, September 15, 16, and 17, 1904, Dr. Mills presented a paper on the location and subdivision of the cortical areas of cutaneous and muscular sensibility. This paper, however, has never been published, and some of its data have been incorporated in the present article.

The view that an area jointly sensory and motor is subdivided into centres of special representation for different portions of the body (Dana, Starr, Horsley and others) must not be confounded with that which holds in the first place, that the areas of representation of movements and of sensibility and of stereognosis are separate; and secondly, that these are subdivided into subareas and centres. It is the latter doctrine which is taught in this paper.

The evidences which favor the subdivision of the sensorial and stereognostic cortex are chiefly clinical cases with or without necropsy in which this subdivision is indicated. The experiment-

al and histological data with regard to cortical motor and sensory localization up to the present time, chiefly have reference to the position and extent of the zones of representation and not to their subdivision. The clinical and clinicopathological cases are of two kinds: those in which symptoms indicate both motor and sensory subdivisional representation and those in which sensory representation alone is illustrated.

We shall not recall here those cases now well known in neurological literature in which both motor and sensory subdivisional localization are indicated, that is, cases in which both loss of power and impairment of sensation were confined to a leg or an arm, or the face or to subdivisions of these portions of the body. These cases are scattered through the literature of the last twenty-five years, and most of them are to be found in the elaborate digests of cases published by such writers as Starr², Dana³ and Verger⁴.

Dana, in discussing the cases collected by him, said that the anesthesia was always circumscribed to the face or limbs or to a special part of the body; it was never complete hemianesthesia when the lesion was cortical. The sensory centres for various parts of the body, as for the face, arm and leg, were however according to him, commonly identical with the motor centres for those parts, but were larger and more diffused. Starr held to a similar view.

We shall now call attention to a series of cases, comparatively few but important, which seem to indicate a large degree of subdivision of the areas of representation of cutaneous and of muscular sensibility and of stereognosis. In the presentation of these cases those first given point only to the subdivision of the cortical areas of representation of cutaneous and muscular sensibility. The later cases indicate that the stereognostic zone is similarly subdivided. In considering the first cases (Knapp, Darkschewitsch, Madden and Starr and McCosh) it must be remembered that they were recorded before the subject of stereognostic conception and astereognosis had been considered in neurological literature. In some of them, therefore, it is probable that astereognosis, as well as impairment of cutaneous and of muscular sensibility, was present.

A case recorded by Knapp⁵ in 1891 is confirmative of the subdivisional sensory representation in the cortex and might also

be regarded as evidence in favor of the separate cortical representation of movements and of sensation, as the lesion was presumably behind the central fissure. The most interesting fact in the present connection is that the loss of cutaneous sensibility involved only the hand and forearm. This case was one of traumatic brachial monoplegia with limited loss of sensation. The patient had received a wound on the head during the Civil War and was operated on about thirty years afterwards. During the operation the surgeon injured the cerebral cortex in what was supposed to be the middle portion of the left postcentral convolution, the lesion being recorded as about one centimeter long and about three millimeters in depth. The results of this surgically produced lesion were disorders of sensation, which continued while the patient remained under observation. They are recorded as having been present at the end of the year. Tactile sensibility was much diminished in the right upper extremity; the patient had no consciousness of the position occupied by the extremity; muscular sensibility was lost in it. The sensations of pressure and weight were also lost, but pain and temperature senses appeared to be normal. The loss of cutaneous sensibility extended only to the elbow.

Darkschewitsch⁶ recorded a case in which general sensibility was entirely diminished in all its forms in the right upper extremity, and especially in its periphery. Sensibility was unaffected in the right leg and right side of the face, and these parts also presented no affection of motility. At the necropsy a solitary tubercle was found in the white substance of the left cerebral hemisphere, subjacent to the cortex of the middle portion of the postcentral gyre. It will be seen that this lesion corresponded closely to what we regard as the subarea of cutaneous and muscular sensibility for the right upper extremity.

Madden⁷ recorded a case of cortico-subcortical tumor with apoplectiform attacks preceded by a sensation of pressure, with incoördination of the arm and forearm of the left side followed by paralysis of the leg and arm of the same side. Examination showed that on the left hand tactile sensation was much altered and that it was completely lost in the ring finger. The muscular sense was also lost, and at times there was marked ataxia. The disorders of sensibility became more and more apparent as time advanced. At the necropsy a prominence, thinning of the dura

and depression of the cranium were found on the left side at a point half an inch to the left of the longitudinal sinus in the postcentral gyre. Symmetrically situated on the opposite side was a smaller prominence. Underneath this prominence was found a cystic tumor which involved the postcentral, the superior parietal, supra Sylvian, and the inferior portion of the angular and occipital convolutions.

Starr and McCosh⁸ reported a case in which, for the relief of spasmodic attacks, trephining was performed and a small angioma removed. The operation was followed by loss of muscular sense in the opposite hand and forearm without any disturbance of other sensations or of movement. There was also marked ataxia in this limb. The place of operation corresponded to a spot about the junction of the superior and inferior parietal convolutions, and distinctly posterior to the postcentral convolution.

In a case reported by Klien⁹ of trauma of the left side of the skull, in which the injury was supposed to have involved both the precentral and postcentral convolutions, there was a resultant paresis of the right side of the body. Sensation for light touch was diminished over the whole right side, but touch applied a little more deeply was disturbed only in the right arm. This was especially so in an irregular area over the radial side of the right hand and forearm. The pain sense was disturbed over this same area, but temperature sense was somewhat altered over the whole right side. The sense of position and stereognostic conception were disturbed in the whole arm, and there was considerable ataxia of this arm.

Bonhoeffer¹⁰ in a study on disturbances of sensation due to cortical lesions, reported a case (case 4) in which, because of a depression of the right parietal bone, paresis of the left arm, and especially of the hand was present. Sensation for pain was diminished over the whole left side, but especially so in the upper limb. The sense of touch, of localization, of motion, and of position, and stereognostic conception were impaired over the whole hand, but especially so in the third, fourth and fifth fingers.

Fischer¹¹ reported a man of twenty-three years, who because of numerous cysts in the cerebral cortex, had attacks of Jacksonian convulsions, which always began with a feeling of numbness in the fourth and fifth fingers of the left hand. The patient was operated upon in the right motor area and a cyst due to a

cysticercus was excised. The patient improved, but subsequently the Jacksonian attacks reappeared.

When examined by Fischer sensation for touch and pain was lost in the three ulnar fingers and in the ulnar side of the hand both in the palmar and extensor surface up to the wrist. From here to the elbow there was hypesthesia for touch and pain. This sensory disturbance faded imperceptibly into the surrounding parts. The sense of localization, of movement, and of position, and stereognostic conception were lost only in the fourth and fifth fingers. Power was little if at all disturbed in these parts. Several days after the examination giving the above results, a complete hemianesthesia for all forms of sensation was obtained, and other symptoms regarded as hysterical were also found. Suggestive treatment removed the sensory disturbance, and because of this the ulnar disturbance of sensation was regarded by the author as hysterical in origin.

It is probable that the disturbance of stereognostic conception and of other forms of sensation in the ulnar side of the hand was of organic origin, and that the subsequent hemianesthesia was due to a superimposed hysterical condition.

Kramer¹² in 1896, in a paper on "Tastlähmung" or touch paralysis, reported a number of cases of localized disturbances of sensation due to cortical lesions. Among these, in one case (case 6), a man of forty-two, after a sudden attack of dizziness, developed weakness of the left upper limb with increased reflexes. Sensation in the left hand for touch, for pain and for temperature was normal. On the third, fourth and fifth fingers, however, there were very mild disturbances of sensation of touch as well as of the sense of localization. The sense of movement was disturbed in the second and third fingers.

In a paper on the sensory disturbances occurring in hemiplegia Sandberg¹³ reported a number of cases of localized disturbance of sensation. In one case (case 1) a man of forty-five, with a history of Jacksonian convulsions limited to the left side of the body, and beginning in the left face, when seen some years after the spasms were noted, showed no motor involvement anywhere. The reflexes were normal. Touch-sensation was somewhat disturbed, especially in *vola manus*, as well as in extensor surface of the hand. Sensation for temperature and for pain was normal. The pressure sense was disturbed in the whole hand.

The sense of movement as well as the sense of localization and stereognostic conception were disturbed somewhat in the whole left hand and especially so in the third, fourth and fifth fingers. Sensation in the right side was normal.

Of the nine (9) cases thus briefly abstracted, only in those in which necropsies were had or in which the operative procedure indicated clearly the site of the lesion, can it be said with positiveness that the lesion was entirely behind the central fissure. Apparently it was behind in at least five of the cases. In all the lesions were in part at least behind the fissure.

The cases are particularly interesting as indicating the limitations of anesthesia and astereognosis, not only to the upper extremity, but to limited portions of this limb, and especially to the hand and certain of the fingers.

The impairments of sensation present were in several instances more or less dissociated, certain forms of impairment being present and others not, or different forms showing themselves in different parts.

It is interesting to note that in four of the nine cases the impairment and disturbance of sensation were greater in the fingers towards the ulnar side of the hand, this showing itself sometimes in two and sometimes in three fingers.

The cases clearly indicate the subdivisional representation in the cortex, and most of them that this subdivisional representation is for definite portions of the extremity, as for certain fingers or for the ulnar or radial portions of the hand.

To these nine cases we shall add four studied by ourselves.

Case 1.—Traumatism and syphilitic meningitis of the parietal lobe; Jacksonian epilepsy beginning in the fingers and hand; astereognosis in the left hand; tactile anesthesia and impairment of pain sense in the left upper and lower limbs; operation for removal of diseased mass from the parietal region; transient paralysis after operation with persistent sensory loss and astereognosis; objects recognized by the left thumb and forefinger, but not by the other fingers, which showed greater impairment of sensation and of co-ordination; second operation and further removal of diseased tissue; astereognosis, ataxia, and impairment of sensation now the same in all parts of the hand and fingers; necropsy showing widespread gummatous meningitis and an area of softening in the postcentral and inferior parietal convolutions, to a very slight extent invading the precentral convolution.

This patient was a man of 41 years, who for four years had been under our observation either in the Polyclinic, the Philadelphia General, or the University Hospital. He had been at various times under the care of Dr. Wm. G. Spiller. He was not married and admitted a specific history. He had been a hard drinker and five years before he first came under our observation, while having a fight in a saloon, was thrown out into the middle of the street, and was taken to the Pennsylvania Hospital, where it was said that he had concussion of the brain. He was unconscious for about twenty-four hours. Four years after this, while again drinking, he fell backwards and struck the back of his head on a brick sidewalk. His head was cut in the parietal region a little to the left of the median line.

When he first came to the dispensary of the Polyclinic Hospital, April 29, 1902, examination showed the right side of the head to be more prominent in the parietal region. About 9 cm. (3.54 in.) above the attachment of the ear to the head was a depression in the bone about the size of a little finger. This area was very sensitive to pressure. Dullness was obtained over this part. The patient dated his headache from this accident, it being frontal and persisting night and day. He also had what he called sharp neuralgic pains. At times he vomited after eating and he also complained of nausea.

On Feb. 3, 1902, he had his first convulsive attack. This began with pain in the tips of the fingers of the left hand; then passed to the back of the hand, and according to his description, his fingers were twisted in every shape. The convulsion then crept up his arm, the patient experiencing pain in the top of the left shoulder, after which he lost consciousness, frothed at the mouth, but did not bite his tongue nor void urine. His arm was not weak after the attack.

When examined, station and gait were normal, the eyes both as to condition of the pupils and extra-ocular muscles were normal, and sensation was normal all over the body. The reflexes were also not altered except the right patellar jerk which was slightly increased. Even at this time he called a quarter a five cent piece in the left hand. Motor weakness was everywhere absent.

From this time until his admission to the Polyclinic Hospital, April 29, 1902, he had several convulsions, all of which were similar in character to the first, except that they became longer. He would at times complain of pain as if an electric shock would start in his hand and travel from the finger tips to his forearm and arm, and his fingers would feel cold and numb after the attacks. On his admission to the hospital examinations showed that the grip of the left hand was not as strong as that of the right, and that he could not recognize any object placed in the left hand.

Five days before the operation was performed upon him

examination by Dr. Spiller showed complete loss of stereognostic conception in the left hand and complete tactile anesthesia and impairment of the sense of pain in the left upper limb. Sensation for touch and pain was also diminished in the left lower limb. The reflexes in the left upper and lower limbs were increased, but not markedly exaggerated. Ankle clonus and Babinski response were absent on this side. Sensation and the reflexes on the right side were normal. The sense of position in the left arm was lost and was impaired in the left leg. The eye examination did not show anything abnormal except a slight paleness of the left optic disc.

The examination of the patient, five days later, just before the operation, showed almost complete paralysis of the left upper limb, the patient being in a mild stupor, although able to answer questions. Sensation seemed about the same as in previous examinations.

Dr. John B. Roberts, under complete anesthesia, operated over the right parietal bone, and after dissecting up an oval flap he found a spot of carious bone about the size of half a dollar. This was easily removed by bone forceps. The dura was thick and was cut away, exposing a hard mass about the size of a pigeon's egg, with several small nodules attached. A part of this mass was brain substance.

The patient made a good recovery. Examination several days after the operation showed almost complete paralysis of the left upper limb and some paralysis of the left lower limb. Tactile sense was almost entirely lost in the left upper and lower limbs, pain and temperature senses were only slightly impaired in the left upper limb and preserved in the lower limb, the sense of position was lost in the fingers and toes on this side. The reflexes were exaggerated, but there was no Babinski response. About three weeks after the operation the man left the hospital. The paralysis in the left upper limb had almost completely disappeared, the return of voluntary power being remarkable in view of the complete paralysis which existed previous to the operation, and the fact that considerable brain tissue had been removed. Stereognostic conception was completely lost in the left hand and there was still some impairment of sensation in the left upper limb.

The microscopical examination of the specimen removed at the operation showed intense inflammation and round cell infiltration, suggesting syphilis and gumma of the cortex.

For six months after the operation the patient was well and he had no convulsions. He was completely free from headache, nausea and vomiting. He had, however, in the meantime resumed his previous alcoholic habits, and he had not been regular in his taking of potassium iodide, which was given to him after the operation. About six months after his operation he began again to

complain of convulsions, and these were similar in character to those previously described. When examined, March 9, 1903, about nine months after the operation by Dr. Weisenburg, the patient complained of considerable persisting frontal headache, nausea and vomiting. His gait and station were good. The grip of the left hand was weak, this being the only sign of motor involvement. Sensation for touch and for pain was disturbed over the left upper limb, and somewhat in the left lower limb. The reflexes were generally increased, but were more so on the left side. He called attention to the fact that he was able to recognize objects placed between his left thumb and forefinger, but could not recognize any object in his other three fingers. Examination confirmed this fact. He stated that he had had this condition since his recovery from the operation. A further examination showed that the sense of position was lost entirely in the three ulnar fingers, but was preserved in the thumb and forefinger. Sensation for touch and for pain was also disturbed more in the ulnar three fingers and less so over the skin covering the thumb and forefinger and the radial side of the hand. In the finger to nose test considerable ataxia was apparent and this was also more marked when the ulnar fingers were directed to the nose.

He constantly complained of an agonizing pain in the left upper limb; in fact, he came for treatment principally because of this and his convulsions. He stated that his left upper extremity constantly felt as if it were being cut by a knife or as if he were having a convulsion. These pains existed for over two years, until the time of his death. Towards the latter end of his life he would also complain of pain in the lower limb and sometimes in his face, chest and abdomen, but mostly the pains persisted in the left upper limb. The convulsions would always start in the left upper limb. During these the pains would become excruciating. During most of the convulsions he would not lose consciousness.

Because of the increase of headache, nausea and vomiting, and the increasing number of convulsions, he was admitted to the University Hospital and was again operated upon, this time by Dr. C. H. Frazier, on Oct. 15, 1904. In the operation the incision followed the line of that made at the original operation. The scalp and dura seemed more or less fused together and the dura was adherent to the substance beneath. After the dura was opened, grayish tissue was found beneath and scraped away. The brain was much congested. Gummatous tissue was also scraped away from the inner side of the dura.

The patient was not much benefitted from the operation. The convulsions were just as marked and the pains just as severe. He had, however, some relief from his headache, nausea and vomiting.

Ophthalmoscopic examination at no time revealed anything but a slight paleness of the optic discs of both sides. The convulsions now, instead of always starting in the fingers of the left upper limb, would sometimes start in these and again in the abdominal muscles of the left side. The patient's condition grew gradually worse, the convulsions became more frequent and the pains of such intensity that he had to be kept constantly under the influence of narcotics and hypnotics. Examination just before his death showed some weakness of the left upper limb, but none of the face or of the lower limb. Sensation for touch, for pain, and for temperature was disturbed over the left upper limb and less so over the left lower limb.



Photograph of Brain of Case 1. Area of Softening Involving Part of the Upper Portion of the Postcentral Convolution and the Anterior and Superior Portions of the Inferior Parietal Convolution. A Little of the Precentral Convolution Was Also Involved.

Directly after the operation by Dr. Frazier it was noted that he was unable to recognize objects placed in his whole hand, whereas previous to the operation he could do this between his thumb and forefinger. The loss of the sense of position, the ataxia, and the impairment of sensation all seemed to be equally marked in all portions of the hand. The patient died about Jan. 1, 1906.

Necropsy was performed by one of us (Dr. Weisenburg). The scalp over the right side of the skull was adherent, especially over the site of the operations, and had to be dissected away. The right portion of the skull was exceedingly carious and was cut

away without much effort. The bone and the dura were adherent almost over the whole surface of the brain, but especially so over the right side where it had to be dissected away. On removing the skull a thick gummatous meningitis was found, this being marked over both hemispheres, but especially so over the right hemisphere. Over the right parietal area it was at places almost a quarter of an inch thick. When removed, an area of softening was found over the right parietal lobe. This area, as indicated in the photograph, (Fig. 1) involved part of the upper portion of the postcentral convolution, a very little of the adjacent precentral convolution, and the anterior and superior portions of the inferior parietal convolution. The microscopical examination showed typical syphilitic exudation.

A careful examination of the spinal roots of the fourth, fifth, sixth, seventh and eighth cervical and first thoracic segments of either side showed no round cell infiltration. The roots were cut separately.

Case 2.—Parietal injury with unconsciousness; ataxia, loss of the sense of position, astereognosis, and impairment of the senses of touch, pain, temperature and spacing in the hand and upper extremity; later cutaneous sensibility, the senses of position and of movement, and stereognostic conception better in the thumb and forefinger and radial side of the hand and forearm than in the other fingers and ulnar side; touch and pain senses were more disturbed in the distal than in the proximal portions of the hand; pain sense more appreciated in the palmar than the dorsal surface.

The history of this patient was given by Dr. Spiller in the Feb., 1906, number of the JOURNAL OF NERVOUS AND MENTAL DISEASE, in a paper on separate sensory centres in the parietal lobe for the limbs. We will first give his account of the case, somewhat condensed. A man, 38 years old, was struck over the right parietal lobe with a club on July 21, 1904, was unconscious for one or two hours and was confined to his bed about ten days after receiving the blow. For two weeks he could not move the fingers of his left hand, either as the result of motor weakness or of sensory disturbance. The hand, which at first felt "dead," had been paresthetic since the injury. He had never had any objective or subjective disturbances of sensation in the left lower limb or face.

When examined on Dec. 11, 1905, the movements of the left upper limb were awkward, although it could be moved freely at all parts and was not weak. He was unable to button his coat with his left hand alone when his eyes were closed, because of incoördination of the fingers, but could button it promptly with his right hand. The sense of position was greatly impaired in the fingers of his left hand, and he was usually unable to tell which finger was moved or when a finger was bent backward or

forward. Stereognostic conception was also greatly impaired in his left hand, and usually he was unable to name any object placed in this hand if he did not see it. Occasionally if the object fell from the hand he was unaware of the loss. Sensations of touch, pain and temperature were diminished in the left hand, but not to the same degree as were the sense of position and stereognosis. He occasionally answered correctly when his left hand was touched or pricked with a pin, but usually his answers were uncertain and in marked contrast to the positiveness with which he replied to sensory tests of the right hand. The sensation of touch was a little less acute in the left hand than in the left arm above the elbow. Pain sensation was less altered than tactile sensation, and temperature sensations for both cold and warmth were more nearly equal in the two upper extremities. The spacing sense was also greatly altered in the left hand, and he could not tell whether the thumb and first finger were near together or far apart. In the right hand he could tell whether the thumb and first finger were one or two inches apart. Sensations on the chest seemed to be the same on the two sides.

The left lower limb was not affected. His answers to sensory stimuli were always correct and prompt. He recognized at once any movement of the toes and the direction in which they were moved. The limb was not weak. The patellar reflexes were not prompt. Sensation in the left side of the face appeared to be entirely normal, and the right side of the body was not affected. Hemianopsia was not present.

The case, according to the writer of the paper, seemed to indicate that the sensory centre for the upper limb was distinct from those for the face and lower limb.

When this patient was examined by one of us (Dr. Weisenburg) on Feb. 19, 1906, he was able to recognize a knife between the thumb and forefinger of the left hand, but was not able to do so with the other fingers. He was also able to recognize properly a coin, as a quarter, but in a few minutes his ability to recognize objects placed between his thumb and forefinger was not so good. Sensation for touch and pain was better on the skin over the thumb and forefinger than over the ulnar part of the hand. This difference in sensation between the radial and ulnar portions of the limb was also apparent on the skin covering the forearm up to the elbow, this differentiation not being apparent above this point. It seemed as if touch and pain were better recognized as the radial side of the hand and forearm was approached.

The sense of position was lost in the three ulnar fingers, impaired in the forefinger, and about normal in the thumb. The same could be said of the sense of pressure, the sense of localization and the sense of movement: in other words, the sense of pressure, of localization, of position and of movement were all

better recognized as the radial side of the hand was approached. These different perceptions were lost or almost entirely lost in the two ulnar fingers, appreciated in the middle finger, better appreciated in the forefinger, and almost normally appreciated in the thumb. Bone sense, or that sense which is obtained by touching the bony parts with a vibratory tuning fork, was similarly better recognized as the radial side of the hand was approached. Repeated subsequent examinations invariably demonstrated the above facts. The ability to recognize objects between the thumb and forefinger was sometimes quite marked, and again the patient was barely able to recognize familiar objects.

Considerable ataxia was present in the finger to nose test, and this was more marked when he was told to place the ulnar fingers to the nose than when the other fingers were used. He complained continuously of a numb "breaking" feeling in his left hand, and also that he was very susceptible to temperature changes. When it was cold or warm his hand responded with extreme sensitiveness to changes in the weather from warm to cold or the reverse.

Subsequent examinations for sensation developed the interesting fact that touch sensation was altered more in the distal part than in the proximal parts of the fingers and that no difference in appreciation between the flexor and extensor surfaces of the hand existed. Touch sensation on the dorsum of the hand, however, was better appreciated as the thumb was approached. Sensation for pain was also more disturbed in the distal parts than in the proximal portions, but was distinctly better appreciated on the flexor surface of the hand than on the extensor surface. Different tests for temperature sensation did not seem to demonstrate any alterations from the normal. Applications of faradic electricity were much better appreciated on the palmar surface than on the extensor surface.

In one examination when the relaxation of the left hand was almost perfect it seemed as if the loss of the sense of position was more marked when the fingers were bent backward, that is, to the extensor side, than when they were bent forward to the palmar. This observation, however, was only made once. It may be said in passing that it is most difficult to obtain complete relaxation of the hand, and it is only when this is fully obtained, that the test for the sense of position is of positive value. It is our practice when testing for the sense of position to grasp the patient's hand at the wrist and ask him to completely relax, so that the slightest voluntary attempt of the patient to move his hand can be appreciated by the examiner by the transmission of motion to the palpating hand.

With regard to other examinations it need only be said that Dr. Spiller's report as to the sensory conditions was fully confirmed.

Case 3.—Apoplectic attack with left hemianesthesia, more marked in the upper extremity; later limitation of sensory losses to the left upper limb; still later touch and pain more disturbed in the distal than in the proximal portions of the fingers and hand; touch and pain also better recognized on the radial than towards the ulnar side of the hand; the sensations of pressure, localization, position and movement, and stereognostic conception better preserved in the thumb and forefinger than in the other fingers.

This patient was exhibited by Dr. C. D. Camp before the April meeting of the Philadelphia Neurological Society. She was a woman, 43 years of age, who had had four children and four miscarriages, and had an alcoholic but no specific history. Eight days before her admission to the nervous wards of the Philadelphia General Hospital, April 17, 1906, where she was under the care of Dr. J. H. Lloyd, she became excited, ran a short distance, sat down and immediately afterwards, trying to get up, fell, owing to weakness of the left side. She was not unconscious, but had a "peculiar" feeling in the entire left half of the body.

When examined by Dr. Camp on her admission the patient did not manifest any motor weakness in any portion of the body. She had no ocular nor facial palsies, and the limbs were moved equally and well in all directions. The tendon reflexes were, however, increased on the left side, and a distinct Babinski response was obtained on this side. The reflexes on the other side were normal. The patient had almost complete loss of sensation for touch and pain and temperature over the whole left half of the body, this not being limited, however, to the median line. The sensory changes even at this time were more marked in the upper limb than in the other parts. Examination of the visual fields showed no alterations. No symptoms of hysteria were present.

In a subsequent examination by Dr. Camp sensation was not as much disturbed as before. In the course of several weeks almost complete return of sensation in the left lower limb and over the chest, abdomen and face had taken place. The loss of sensation was now limited to the left upper limb. Dr. Camp also found considerable ataxia and complete astereognosis in this hand.

When examined by one of us (Dr. Weisenburg), about three weeks after the stroke, there was practically no involvement of the motor functions on the left side. The reflexes on this side were still somewhat exaggerated, and the Babinski response was prompt. Sensation in all forms was considerably disturbed in the left upper limb, and very little, if at all, in the other parts of the body. The senses of touch and of pain were more disturbed in the distal than in the proximal parts. A closer examination showed that the senses, both of touch and pain, were

better recognized on the radial than on the ulnar side of the forearm. As in case 2, these two sensations were better recognized as the radial side of the hand was approached, both on the flexor and extensor surfaces.

The patient was unable to recognize clearly an object placed in any portion of the hand, but she was able to appreciate the smoothness or hardness or density or angularity of all objects with the thumb and forefinger, but could not do this with the other three fingers. Similarly numbers drawn on the palm seemed to be somewhat better, if at all, appreciated over the radial side of the hand than over the ulnar.

The senses of pressure, of localization, of position, of movement were all better recognized as the radial side of the hand was approached. This differentiation was as well marked as in case 2. Considerable ataxia was also present in the affected hand, and this seemed more marked when the ulnar fingers were approached to the nose than when the index finger was used in the test.

Case 4.—Initial Jacksonian attack chiefly causing flexion and extension of the forearm; sudden loss of ability to extend the flexed index and middle fingers; two weeks later a similar transient affection of the ring and little fingers; paroxysmal paresthesia showing itself as a peculiar sensation passing along the outer or ulnar border of the arm and forearm; disappearance of the attacks in the ring and middle fingers in about four months; improvement for several months, then renewal of paresthesia now affecting the ulnar border of the forearm; inability to freely abduct the little finger independently of the ring finger; tremor and moderate ataxia of the right upper extremity as tested by index and little finger to nose tests, also by writing and other methods; slight hypæsthesia to touch over the ulnar border of hand as tested with cotton, this disappearing as tests continued; pressure sense retained everywhere; disappearance of sensory phenomena for two months followed by another paresthetic attack affecting the mid dorsum of the hand, the entire index finger, half of the middle finger, and distal phalanx of the ring finger; sudden transient loss of ability to use the middle finger; no objective sensory impairment, but persistence of former tremor and ataxia; no aster-cognosis.

A man over sixty years of age six years before coming under observation, first had an attack of jerking or twitching of the right arm of brief duration. The arm was adducted, and the forearm flexed, and while so held the movement affected the entire limb, although it chiefly showed itself in slight extension and flexion of the forearm.

Later he was treated for an abscess of the gall bladder, a condition which probably had no connection with his attack of local spasm.

For five years he remained in good health, until four weeks before the time when he first consulted one of us (Dr. Mills), when he suddenly lost the power, or apparently lost the power, to extend the flexed index and middle fingers, the other fingers being little if at all affected. Two weeks later he had a somewhat similar affection of the ring and little fingers. He could flex these, but for a few hours he could not extend them after they were flexed. This condition passed away during the night.

At this time and since at intervals he has suffered from a local paresthesia. He described this paresthesia as a peculiar sensation passing down the outer side of the upper arm to the ulnar border of the forearm. The patient had had no headache, vertigo, vomiting or other symptoms, being, except as above stated, in good health.

The patient was seen by Dr. Mills at intervals for four months, and then not for seven months. During the first three or four months the attacks of flexor spasm gradually disappeared. For the next six months his improvement continued, at least as regards the flexor spasm and paresthesia and the use of the fingers and hand. He became able to write, which he could not do before, so that he could attend to his own personal letters. It was, however, necessary for him to form his letters carefully, writing slowly.

After six months elapsed he again had a renewal of the paresthesia, which at this time chiefly affected the ulnar border of his right forearm. He had no return of the flexor spasm and inability to extend the fingers, but a peculiar condition of the ring and little fingers with regard to voluntary movement came on. He could not abduct the little finger of the right hand as he could that of the left, keeping the other three fingers in contact. He could, however, if the first fingers were held together by a rubber band or by the hand, abduct and adduct the little finger slowly, but not with as much freedom as the little finger of the other hand. When he did not hold the other fingers together and attempted to abduct the little finger, the ring finger invariably went with it as if the two fingers were glued together.

He had some tremor of the right upper extremity, especially of the hand; also a little of the left, but very slightly marked as compared with that of the right. Testing for ataxia of the upper extremity by the ordinary finger to nose method, some atactic tremor or ataxia of the right upper extremity, but none of the left, was found to be present. Testing by touching the nose with the little finger, while the index, middle and ring fingers were held together by a rubber band, the atactic tremor was about the same as when the test was made with the index finger. A similar test made on the left showed no tremor, or one so slight as to be scarcely noticeable.

No changes in sensation could be determined by coarse or

comparatively coarse methods. The upper extremities were carefully tested by gently touching the parts with cotton. No loss of sensation could be detected by the most delicate methods in the left upper extremity, and none in the right except over a very limited area on the ulnar side of the right hand. A small area over the right hypothenar eminence was hypesthetic, or at least transiently hypesthetic, the diminution of sensation disappearing as repeated tests were made. These repeated tests showed that when he was first examined by delicate touches, the impairment went to the line of the metacarpophalangeal articulation of the little finger; after the tests were continued for a time he began to discriminate in this area as in other parts of the hand.

Testing him by Head's method for pressure sense it was retained for slight pressure in the tactile hypesthetic area. The pain and temperature senses were also retained, and no astereognosis of any part of the hand could be made out.

The knee-jerk on the right side was diminished; on the left it was distinctly plus. Achilles jerks were present and equal on both sides.

For about two months after the above phenomena were noted, the patient again improved in the use of his hand, gradually regaining power to separate his little from his ring finger in a nearly normal manner. The ataxia remained, but he improved in his ability to write. After the two months, however, he had another seizure which showed itself in a sensation of numbness or tingling, which starting near the middle line of the dorsum of the hand, passed down, enveloping the index finger, the middle finger from its tip to about the second phalangeal articulation, and the distal phalanx of the ring finger. The thumb and other parts of the fingers and the hand remained normal as to sensation. This paresthesia remained, and about two days later his middle finger suddenly became weak so that objects could not be held by it. No paresthesia had returned in the little finger and ring finger and ulnar border of the hand and forearm. The little finger could now be separated volitionally from the ring finger, although this, as other movements of the fingers, was awkwardly performed. He still had ataxia or atactic tremor in the upper extremity, especially showing itself in the hand and finger tests. He wrote his letters well, but with difficulty and rather painful slowness.

The patient called attention to an interesting fact which illustrated the difference between the control of the little finger of the right or affected limb and that of the left. He could insert the little finger of the left hand into the ear and manipulate it without the slightest difficulty, but he always had difficulty in inserting the finger of the right hand into the ear, although when it was once placed in this position he could move it around ap-

parently with the same force and ease as the finger of the other hand.

Careful examination for objective impairment of sensation showed no loss, even to light touches, and no errors of location. His chief affection of the hand and fingers seemed to be, as it had always been, paresthetic and ataxic.

These four cases show a few points of great interest in connection with the subject of our paper. With regard to the positions of the lesions, as necropsy was obtained in only one case, of course nothing that is absolute can be said. In the one case with necropsy, the lesion destructive of the cortex and subcortex, was almost entirely in the postcentral and sub-parietal convolutions, only invading precentrally to a slight extent in one position. In the second case, first recorded by Dr. Spiller, the presumption is in favor of a lesion posterior to the central fissure, and this is true also of the third. In the fourth case, presuming it to be due to a cortical cerebral lesion, this is probably situated in the postcentral convolution, invading somewhat precentrally and posteriorly towards the sub-parietal region.

In the four cases the tendency was shown by the sensory disorders to select the ulnar or the radial side of the hand. In three of them the impairment of sensation, and the astereognosis were more persistent and decided in the middle, ring and small fingers and the ulnar portions of the hand. The thumb and index fingers were the first to improve and the last to succumb to persistent sensory disorder.

In all of the cases touch and pain senses were more disturbed distally than proximally in the fingers and hand.

In the first three of the four cases the sensations of touch and pain were more disturbed on the extensor or dorsal surface of the hand than on the flexor or palmar surface. This is an observation, which so far as we knew, at the time of the examination, had not been previously made.

In one of the cases (case 2) when the hand and forearm were totally relaxed, the patient had not the sensation of position and movement when the fingers were bent outward (extended), although he recognized position and movement when the fingers were bent inward (flexed). This is also, so far as we know, an observation not before made.

In the fourth case, which is one of great interest, the diagno-

sis of a cortical lesion, largely parietal, may of course be questioned, but a thorough consideration of the mode in which the sensory and paretic attacks in the upper extremity occurred, the persistence of ataxia in this extremity, although this was not marked, and the absence of positive symptoms which might relegate the case to the cerebellum, spinal cord or periphery would seem to make the diagnosis of a cerebral lesion or condition necessary. One of the most interesting points in this case was the absence of astereognosis, although ataxia was present and persistent, and paresthetic attacks recurred. The case lends some support to the view of the authors that the stereognostic zone is independent of the areas both of cutaneous and muscular sensibility, and also of the motor area.

It might be worth while in this connection to say a few words about the question of the existence of separate stereognostic and sensory areas from the standpoint of the development of function in the individual. Some recorded observations have shown that in children up to a certain age, while the sensations of touch, pain and temperature, are evidently recognized, topognosis, or the sense of location, stereognosis, and to some extent the musculo-arthroidal sense are wanting. These functions and their anatomical substrata develop as the infant becomes the child and the child the young adult. These facts lend support to the view taken by the writers that the localization of cutaneous sensibility is close to the motor zone, while the musculo-arthroidal sense and stereognostic conception are probably, as would be expected, in the concrete memory field or posterior association region or closely adjoining this region.

It is noteworthy in our four personal observations, in several of the nine observations collected by us, and also in the cases recorded by Russell and Horsley, to which attention will be presently called, that the impairment or loss of sensation in cases remaining under observation was invariably more persistent (unless the entire hand remained anesthetic), in the ulnar or post-axial portion of the limb. This is an observation of interest and one calling for explanation. It is probable that this lies at least in part in the fact that the cortical centres, sensory, stereognostic and motor, for those functions which are most frequently active in the individual have larger areas of representation, and that these are more deeply organized.

The earlier return of sensation or its greater persistence in flexor or palmar surface of the fingers and hand, and the more pronounced and persistent loss of the sense of position and movement in extension have a similar explanation.

The second proposition of this paper is that every muscle or group of muscles producing movement or movements which are represented by separate centres in the cortex is topographically related to a segment of the skin, which has also a definite cortical centre, this centre being correlated anatomically and functionally with the motor centre.

We believe that cases of limited sensory disorder due to lesions of the cerebral cortex or subcortex can be differentiated from the sensory affections of spinal, neural and hysterical origin, and also from anesthetics due to lesions of the thalamus and internal capsule, although this differentiation must, in some instances at least, be made by a study of concomitant clinical phenomena.

Some experiments in hypnotism may give a clue or a partial clue to the manner in which the cutaneous periphery is cortically represented and peripherally correlated to the musculo-arthroidal apparatus. To illustrate our meaning we might cite the following quotation from Heidenhain:

"Stimulation of different parts of the skin of the trunk constantly produces localized reflex movements; in the determination of these Dr. Born has kindly assisted me.

"Gently stroking the skin of the back at the sides of the spinal processes of the upper dorsal vertebræ causes elevation of the arms, with simultaneous slight flexion, so that the hands tend to meet above the head.

"Stimulation over lower dorsal vertebræ produced contraction of latissimus dorsi and rhomboidei, with resulting powerful backward movement of both arms and simultaneous flexion.

"Stimulation over the last dorsal and first lumbar vertebræ caused tonic contraction of the whole erector spinæ, with simultaneous elevation of the ribs (levator costarum, intercostales) without accompanying contraction of the diaphragm, and hence passive sinking in of the abdominal muscles.

"Stimulation over the lower lumbar vertebræ and sacral region, the person being seated, caused contraction of flexors of leg, then of the ileo-psoas, and hence, the thigh being fixed owing

to the sitting posture, the trunk was drawn down towards the thigh.

"Stimulation of the skin near the sternum: strong contraction of the pectoralis major, so that the arm was drawn to thorax; simultaneous stimulation of the extensors of arm.

"These reflex movements, which depend on the spinal cord and the medulla oblongata, represent a new series of phenomena in hypnotized persons, for previously only imitation movements, or such movements as had been passively induced by the operator, were known.

"It is certain that methodical investigation of the whole surface of the body would lead to the discovery of many more reflex relations."¹⁴

It will be seen in these experiments that the portions of the skin on which the stroking experiments were made were usually topographically correlated to the muscles or to some portions of the muscles through the instrumentality of which the movements resulting were performed.

We are not certain as to the exact state of the central nervous system during the existence of hypnosis. It is generally believed, however, that higher levels of the nervous system are in abeyance, that the activity of certain cortical cells is for the time being inhibited. The hypnotized subject is more or less lethargic and anesthetic because of the withdrawal through suggestion of the centres concerned with sensory and other forms of recognition. Persistent stimulation of certain areas of the skin unlooses the inhibited cerebral sensory centres and allows the cerebral reflex arc to be completed, the movements resulting being represented in segments of the spinal cord and re-represented in the cortex by cortical motor centres which are correlated to the sensory centres which have been called into action.

It is not probable that the areas of the skin which are separately represented in the cortex are in every instance exactly over the muscles, the cortical centres for whose movements are correlated to the cortical sensory areas, but skin and muscles, sometimes at least, bear this somewhat exact relation to each other; in other instances it may be that the cutaneous zone is related to certain portions of the muscles (as to their origins or insertions) concerned in the movements elicited. We do not know the exact topographical relations of correlated areas of the skin and mus-

cular groups, but that they bear some relation like that above suggested, cannot be doubted.

To make our view as clear as possible we might cite some illustrations. The muscles performing certain very specialized movements, like that of flexion or of extension of the index finger, of adduction of the thumb, of ulnar extension of the hand at the wrist, or of flexion of the forearm at the elbow, have certain topographical relations with cutaneous areas. For the most part these cutaneous areas are over the muscles, or over the muscles, tendons and joints, concerned in the performance of the specialized movements. These cutaneous sensory areas are separately represented in the cortex, and the separate sensory areas of the cortex in turn are anatomically and functionally correlated with cortical motor centres.

The above views were presented by one of us (Dr. Mills) at the meeting of the American Neurological Association in St. Louis in September, 1904, and were prepared for publication in the present paper before the appearance of the paper by Russell and Horsley, to which attention will be presently called in detail. In a recent paper by one of us¹⁵ our views with regard to the peripheral correlations between skin areas and muscular groups were presented as follows:

"In the periphery, segments of the skin are over or closely related topographically to the muscles producing movements which are represented in the motor cortex by centres which are connected with cortical sensory centres representing these cutaneous segments or areas. The segment of the skin covering the muscles producing adduction of the thumb, for instance, is represented in the cortex by a centre which is distinct but neuronally associated with the cortical centre for this movement of the thumb."

It will be seen that to a certain extent this view is in accord with the theory of Russell and Horsley of spinal segmental representation in the cortex. Preaxial, postaxial and midaxial cutaneous areas in the upper limb, for instance, may contain within them cutaneous subareas, each of which is represented by a cortical centre, and each of which is more or less correlated in position and extent to a preaxial, postaxial or midaxial muscle or muscular group. It is probable, however, that the areas of the skin represented in the cortex do not arrange themselves in the well-defined strips which correspond with the segmental or

nerve root distributions. We may eventually get the diagnostic clues which will enable us to separate the spinal, neural and cortical areas of anesthesia by studying the differences in their respective topographical zones in patients with cortical, spinal or neural lesions.

The paper by Russell and Horsley¹⁶ is on the apparent representation in the cerebral cortex of the type of sensory representation as it exists in the spinal cord.

The authors first refer to the differing views regarding separate or identical sensory and motor representation, adhering to the view that the areas of cortical representation of motion and sensation, or at least tactility, are identical or coincident. They also apparently adhere to the view, now largely disproved, that sensation and motion are represented almost equally on both sides of the central fissure. Horsley, as indicated in this contribution, has for many years believed that the type of sensory cortical representation is segmental.

It has been pointed out at the beginning of this paper that one of us has held for many years to the view that the representation of cutaneous and muscular sensibility in the cortex is subdivided after the manner of motor representation, the areas of representation, motor and sensory, being not anatomically identical. It was held for instance, in 1895, that differentiated areas and subareas for sensation were present in the cortex and that no part of the brain was more likely to contain these differentiated areas for sensation than the gyrus fornicatus, the hippocampal gyrus, the precuneus and the post-parietal convolutions.¹⁷

Neither of us sees any reason for changing the position taken, with the exception that we would now exclude from the region of cutaneous and muscular sensibility the hippocampal convolution and would include in it the postcentral convolution, and probably also the posterior and inferior portions of the paracentral lobule.

Russell and Horsley admit that the facts collected and the experimental investigations made which point to conjoint sensory and motor localization were largely, if not altogether, based upon an acceptance of the view that the motor cortex was post-Rolandic as well as pre-Rolandic. A view which they now admit is called into question by the researches of Campbell¹⁸ and Brodman¹⁹, although they fail to refer to the investigations of Grünbaum and

Sherrington²⁰ and the paper on cortical faradization of the human brain, published in this country by one of us and Dr. Frazier²¹, and also to other American papers pointing to the sensory and stereognostic functions of the parietal cortex.

Discussing the question of separate motor and sensory localization, Russell and Horsley say "that the view has appeared to them to be contrary to the evolution of the nervous system, since from the point of view of function, every part of the central projection apparatus must be sensori-motor, and from the morphological standpoint, all the homologies of the structure of the pallium compared with that of the lower nerve centres establish the same principle."

This reasoning does not appeal to us, for while it is true that sensation and motion are always represented in a complete reflex arc, spinal or cerebral, it does not follow that each of these functions is represented equally or in the same manner in the same part of this arc. While it is also true that in the lower forms of animal life an afferent fibre, a nerve cell, and an efferent fibre represent the completed nervous system, in the differentiation of the nervous system, as evolution proceeds, such readjustments and intercalations take place that sensory and motor centres become separated in the spinal cord at basal levels of the brain and in the cortex. The most reasonable view, as well as that which we believe is supported by carefully sifted facts, is that the correlated sensory and motor areas are in distinct, although it may be in adjacent portions of the cerebral surface. This is in accordance with the usual method of anatomical and morphological development. As centres and areas are added in connection with the development of higher and higher functions, the additions are made by surface expansion rather than by superimposition of layers. The convoluted cerebral surface assumes its configuration in obedience to this law of surface expansion and elaboration to accommodate centres endowed with different functions.

Russell and Horsley (always taking for granted that the cortex is sensori-motor and on both sides of the central fissure) show that the sort of sensation disturbed in the experiments in cases to which they refer was (1) slight tactility; (2) topognosis; (3) general orientation of the paretic part; (4) occasional pain. By topognosis is meant false localization of the spot touched. They

found that this disturbance of sensation was in the direction of proximality; in other words, the point indicated was nearer the body than that absolutely touched. The error was regarded as segmental. In a case of severe or extensive cortical lesion the patient, when touched lightly on a terminal phalanx, indicated a spot on the dorsum of the metacarpus, and in a less severe case on the next phalanx or the next but one.

We are distinctly in conflict with the view expressed in the paper under discussion that stereognosis is represented all over the motor cortex. We believe that this function has a separate cortical habitation. One of us, and others in this country and in Germany, have published facts which seem to us convincing as to the cortical area of stereognostic conception being postero-parietal in situation. Cases of cortical or cortico-subcortical paresis without astereognosis and cases of cerebral astereognosis without paresis are now on record.

We use the term stereognostic conception by preference, believing that this cerebral function or process in its typical form belongs in the field of concrete conceptual activity. The stereognostic region is a subarea of the concrete memory field.

The most interesting portion of the article by Russell and Horsley is that which relates to the apparent re-representation of the spinal cord metameric type of sensory topography in the cerebral pallium. The spinal segments or metameres, as is well known, are in direct relation with certain nerve roots, and these nerve roots supply the cutaneous periphery in a special manner which differs from the peripheral nerve distribution. Speaking generally, the nerve root distribution to the limbs, especially to the upper limbs, is in a series of longitudinal strips as shown in the well known diagrams of Edinger and others. Briefly stated, the view of Russell and Horsley is that these strips of skin represented by the nerve roots and spinal segments or metameres are re-represented in the cerebral cortex.

Many years since, one of us in an article on spinal localization called attention to the observations and work of Ross²³, Paterson²⁴, Herringham²⁵, Thorburn²⁶, and others in this field. Russell and Horsley refer especially to the observations of Ross and Paterson, and also to the later work of Grünbaum and Sherrington²⁷ and of Head.²⁸

Ross introduced the terms preaxial and postaxial. The pre-

axial portion of a limb is the part situated on the internal or inferior aspect,—in the arm on the radial and in the leg on the tibial side; while the postaxial subdivision of the limb is situated posterior to the long axis,—in the arm on the ulnar and in the leg on the fibular side. The following quotation from the paper on spinal localization will serve to make the matter clear:

“Sensory segmental localization follows certain laws. If the upper extremity, according to Ross, be placed in the embryological position—that is, with the thumb directed outward and upward, and palm forward—the preaxial border from the tip of the shoulder down to the metacarpophalangeal articulations of the index finger and thumb is supplied by the fifth cervical root, and the postaxial border, from the axilla to the finger-tips inclusive, is supplied by the humeral branch of the second, the first dorsal, and the eighth cervical nerves. Observations made in cases of disease of the cauda equina have also convinced Dr. Ross that if the lower extremities be also placed in the embryological or tailor position, the preaxial border is supplied by the cutaneous nerves of the four upper lumbar nerves, and the postaxial by the coccygeal and sacral sensory nerves. He has concluded also that the most distal parts of the preaxial border were supplied from the lower of the four lumbar nerves, and of the postaxial border by the higher sacral nerves.

“The chief law of sensory distribution, as worked out by Herringham and adopted by Ross, is as follows:

“A. Of two spots on the skin, that which is nearer the preaxial border tends to be supplied by the higher nerve.

“B. Of two spots in the preaxial area, the lower tends to be supplied by the lower nerve, and of two spots in the postaxial area, the lower tends to be supplied by the higher nerve.”

Russell and Horsley, also following Ross, define the terms preaxial and postaxial particularly as applied to the upper limbs, showing that the preaxial portion of the limb is supplied by the fifth, sixth and seventh cervical nerves, and the postaxial by the eighth cervical, and the first and second dorsal or thoracic nerves. They believe also that the central line or axis of the limb probably has a special morphological significance, and a special cortical representation.

As evidence of this they present two interesting cases; one

unreported case of Dr. James Taylor and the other of Dr. T. Grainger Stewart²⁹, recorded in 1894.

In Taylor's case the aura of the Jacksonian attacks first began with sensations of pins and needles in the third and fourth fingers of the left hand. In this case a subcortical tumor was removed from beneath the postcentral convolution and forward to the island of Reil. Seventy-three days after operation, examination by medium pressure with pin point showed anesthesia of the dorsum of the hand and proximal errors towards the mid axis.

In Dr. Stewart's case sensation was disturbed in the entire upper extremity, except in a narrow strip in about the mid axis of the dorsal and ventral surfaces. Russell and Horsley hold that these cases and others of a similar character support the inference which naturally arises from the acceptance of preaxial and postaxial representation in the pallium, and that the mid axis of the limb is also there represented.

Russell and Horsley cite the notes of five cases bearing upon the question of preaxial and postaxial subdivisional representation in the cortex. We append the notes of these cases, largely in the language of the writers, simply somewhat condensing them and here and there changing the nomenclature to correspond to that used in this paper.

Their first case, one of Dr. Beevor's, was a man 42 years old, with pachymeningitis involving the right cortex over an area posterior to the central fissure and above the Sylvian fissure, the area including the lower half of the postcentral and the whole of the inferior parietal gyres. "The postero-inferior angle of the part removed included both sides of the posterior third of the Sylvian fissure. The depth of the incision was about 2 cm., *i.e.*, the floor of the lesion was composed of corona radiata.

A. Before operation. Slight diminution of sensibility to pain over hand and forearm to elbow, to camel-hair touch on fingers of the left hand. Loss of sense of position in fourth and fifth fingers, marked astereognosis. Postaxial error of localization on dorsum of middle, ring and little fingers of the left hand. On the palmar surface there was no error. On the dorsum of the left hand and wrist the topognostic error was proximal. The errors were always much greater after a fit, and gradually diminished during the succeeding ten to fourteen days.

B. After operation. (1) Immediately after operation, complete hemianesthesia of tactility and thermal sense, hemianalgesia of face, upper limb and trunk, relative on lower limb, hemianopsia, hemimotor paralysis of arm and face, slightly of leg.

(2) Fourteen days after operation, analgesia less marked. Visual fields restored; shoulder and elbow movements restored; also slight power of flexion and extension of the wrist and fingers. Complete loss of sense of position of the upper limb.

(3) Twenty-eight days after operation. Returning postaxial estimation of position of hand.

The second case of Russell and Horsley (case of Dr. Risien Russell) is recorded as follows: M. B., 40 years old. Glioma (mass removed 5 cm. longitudinal axis, 4 cm. frontal axis, 3 cm. vertical depth) situated immediately subcortical to the junction of the leg and arm centres in left hemisphere. The lesion left by the removal of the growth involved both the central ascending gyres; and extended into the corona radiata to a depth of from 3 to 5 cm.

A. Before operation. Soon after a Jacksonian fit, beginning in the foot and involving whole side and limbs, there was present in the right hand definite atopognosis (proximal error) astereognosis and hemiparesis of right side.

B. After operation. (1) Thirteen weeks after operation. Marked postaxial localization of all light touches on dorsum of digits, as well as topognostic proximal error.

(2) Sixteen weeks after operation. No analgesia, no loss of pain or temperature sense. Defective sense of light touches on dorsum of digits, normal on forearm, very marked proximal atopognostic error on digits and distal error on dorsum of carpus and metacarpus. The error was preaxial on the fourth and fifth digits, and postaxial on the first and second digits. When tested with Horsley's divided plate the postaxial error between the two index fingers was extremely marked.

The third case of the series was one of Sir Victor Horsley. J. C., male, age 56 years. Operation, October 21, 1905. A small myxoma about 3 cm. in diameter situated in the middle third of ascending parietal gyrus was found. There was considerable amount of softening in the corona radiata beneath the cortex, which certainly involved the fibres of the ascending

frontal as well as the ascending parietal gyrus and probably also the fibres of the paracentral lobule.

A. Before operation. Hemiparesis of upper limb. Definite atopognosis proximal, in right hand.

B. Twenty-four days after operation. Anesthesia to light cotton wool touches all over dorsum of all digits, pain and temperature sense normal.

The topognostic error was preaxial on the dorsum of the digits as well as proximal. The latter error occurred as far as the carpus.

The fourth case was also one of Sir Victor Horsley's. G. P., male, aged 62 years. A small glioma occupying the breadth of the right ascending frontal gyrus and extending to the anterior wall of the fissure of Rolando. The corona radiata was compressed slightly, but nowhere softened. The lesion made by the extirpation of the tumor involved the anterior third of the width of the ascending parietal gyrus opposite the crater in the ascending frontal gyrus.

A. Before operation. Marked atopognosis in the left hand (dorsum of digits).

B. After operation. Marked proximal atopognostic error of all digits of left hand. Very marked postaxial error of the same digits.

The fifth case of Russell and Horsley was a patient of Dr. Aldren Turner. W. D., male, 22 years old. At autopsy (a) Small tubercle $\frac{3}{4}$ cm. in diameter growing from pia at junction of posterior part of second frontal, with ascending frontal in left hemisphere. (b) Similar tubercle $1\frac{1}{2}$ cm. diameter in mid third of post central convolution on left hemisphere, and another of about the same size at extreme upper limit of post central convolution. A fourth in right hemisphere $\frac{3}{4}$ cm. in diameter in first frontal convolution.

Case of multiple lesions of the kinesthetic area.

Attacks of spasmodic twitchings in the fourth and fifth fingers of right hand, and simultaneously of eyelids.

Slight motor paresis of the fourth and fifth digits.

Slight anesthesia to light touches on the fourth and fifth digits.

Error of topognosis very slightly distal and preaxial on the fourth and fifth digits.

In the first case of Russell and Horsley, the observations with regard to the radial or preaxial portion of the limb are similar to those recorded by us in our cases, and also by some of the observers cited by us. Russell and Horsley also note a fact to which we have directed attention in commenting on our own cases, that the errors of sensation were less marked on the palmar than on the dorsal surfaces. They also record the earlier preaxial or radial return of sensation and of stereognosis.

In the second case the distinction between postaxial and preaxial sensory disturbance is emphasized, and also between the dorsal and palmar recognition. In this case, as in the others, the differences between proximality and distality in the areas noted are given. In cases studied by us we have not made any observations on this interesting point. In the fourth of our original cases, an effort was made to determine whether there was any difference proximally and distally without any result, although as will be recalled, the impairment of sensation disappeared as the ulnar or preaxial border of the hand was receded from. In this case the impairment of tactile sensation was very slight. In two other cases some experiments were made as to proximal or distal errors, but without result. In the third case of Russell and Horsley preaxial and dorsal impairment was greater, and proximal errors prevailed as in the other cases.

In the fourth case the preponderance of sensory impairment was postaxial, dorsal and proximal.

In the fifth case the anesthesia was more marked postaxially, that is, in the fourth and fifth fingers, and in these fingers it was preaxial and distal.

NOTE.—While this paper is passing through the press, a case illustrating some of the points discussed in it, especially the existence of a separate cortical area for stereognosis, and the subdivision of this area, has come under our notice. This patient was under the care of Dr. R. S. Dorsett, of Philadelphia, with whom the patient was seen in consultation by Dr. Weisenburg, and subsequently by Dr. Mills after the admission of the patient to the hospital of the University of Pennsylvania.

The patient, a man thirty-two years old, with no history either of alcoholism or syphilis, was perfectly well until three weeks before coming under observation, when he awoke during the night with a pain in the left side of the back of the head and in the same side of the neck, this pain disappearing the following

morning. Two days after this, he began to complain of a numb, dead feeling in his left arm, followed in a day by similar sensations over the left chest and abdomen and the left leg. These sensations have persisted. About two weeks after the onset of these sensations he noticed that the grip in his left hand was not as good as before when his attention and eyes were directed elsewhere than to the object grasped. He has never had headache, nausea, vomiting or any disturbance in his eyes.

When examined his eyes and cranial nerves were found to be in a normal condition. The grip of the left hand, when his attention was called away, was not as good as when he was looking directly at his hand, in which case it was normal. The left leg, like the face and arm, showed no weakness. The reflexes were somewhat prompt, especially on the left side, but no Babinski was present. Sensation for touch, pain and temperature, and bone sensation were normal over the left side and everywhere. The senses of position and movement were lost or greatly impaired in the fingers of the left hand, the loss becoming less as the thumb and forefinger were approached. To a less extent the sense of location was disturbed; more so, as the radial side of the hand was approached. The sense of pressure was normal. He could not recognize any object placed in or manipulated by his left hand, the astereognosis being absolute. The hardness or softness of an object, or its surface contour could however be recognized, but only by the tips of his forefinger and thumb, especially the latter.

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EAR AFFECTIONS AND MENTAL DISTURBANCES.*

EMIL AMBERG, M.D.,

DETROIT, MICHIGAN.

(Continued from page 576.)

Class II (cases 4-8), in which mental disturbance may have been caused by: A, exhaustion; B, local irritation; C, intoxication. That mental disturbances are caused by any of these three factors is known.

We know of the severe symptoms which may occur in children suffering from acute middle ear affections. Walb¹⁵ mentions that in children, especially during the first years of life, during the course of an otitis media perforativa the cerebral symptoms can be so prominent that a meningitis is supposed to be present and not a middle ear inflammation.

Jacobson¹⁶ says: "During such a rise of temperature (40° Celsius= 104° Fahrenheit) an acute perforative middle ear inflammation, especially before perforation of the drum membrane, does not infrequently cause the most severe brain symptoms, e. g., dizziness, vomiting, deep sopor, continued deliria, convulsions, picking (Flockenlesen), marked narrowness of the pupils, irregularity of the pulse, which can disappear entirely after the pus gathered in the tympanic cavity has found an outlet through a spontaneous or artificial perforation. They are most frequently seen in children, in which the sutura petro squamosa is still open and in which the fibers of connective tissue going through it can more easily communicate a propagation of the hyperemia or inflammation from the tympanic cavity to the cranium. This can sometimes, however, occur also in adults (Schwartz)."

In my opinion it may be possible that a meningitis of a passing type is really present, namely a meningitis serosa, which has been quite frequently described of late. The anatomical conditions during early life would favor the more easy appearance of such a coaffection of the surrounding parts of the tympanic cavity.

*Read before the Surgical Section of the Wayne County Medical Society, March 26, 1906.

(The expression otitis media perforativa I may say, incidentally, should, I think, not be used, because it does not express a pathologic entity.)

Frank Stephenson¹⁷ says, in part: "Regarding the etiology of insanity, it is of comparatively recent date that particular attention has been directed toward the effect upon the brain of toxins developed by fermentation and putrefaction in the gastrointestinal tract—a faulty metabolism—and from the poisons in the blood developing from acute infections. According to Peterson: 'these toxin producing bacteria may be the chief agents the influence of which acts upon the cortical cells and nerve fibers of the brain.' It is not strange that the blood charged with these toxins should carry agents to the brain, which cause a disturbance of its functions, as we know the blood is the source of all the brain nutrition and the channel for exit of the waste material.

"In brain disorders even without any history having been given of disturbed digestion, on investigation we find evidences of extensive digestive and fermentative changes shown by urinary analysis; that is, diminished or increased specific gravity, abnormal color, a lack of proper ratio between the specific gravity and the amount of urea eliminated; the presence of indican, xanthins, urates, phosphates, oxalates, and other products. Wagner, in the *Klinische Wochenschrift*, February, 1903, reports several mental cases in which indican and acetonuria were in excess, and some of these cases characterized by severe depression left his clinic cured after three days of thorough eliminative and antifermentative treatment. The correction of these errors is also the first step in producing sleep, and in quieting the various nervous and mental manifestations in both borderline and classified insanities. We also prepare the system for making more and better blood, thus controlling not only the toxemia, but the anemia, which is sure to develop and be a stubborn factor in all these cases."

"F. Mott (*Lancet*, August, 1901) says: "The new neurology does not involve merely an acceptance of the neurone theory, but a recognition of the fact that every cell possesses a biochemical sensitiveness to its lymph environment, termed chemotaxis; the alteration of the environment causing, in many cases, the presence of some form of poison.

"We believe, also, that poisons circulating in the blood act

as contributory, predisposing or exciting causes, in persons with a neuropathic or psychopathic heredity.

"MacPherson, at the Stirling insane asylum, reports the case of a young man of sedentary habits who was attacked with a neurasthenic anxiety and digestive cachexia with vomiting, and was so ill it was feared he would die. He recognized nobody and talked as if insane, but after purgation and vomiting excessively, he became rational, slept well, and the next morning was in his usual health.

"Of the acute infectious diseases causing or preceding mental disease or psychoses, la grippe, typhoid fever, malaria, pneumonia, acute rheumatism and neuritis doubtless head the list.

"The term post-febrile insanity is given to disorders which complicate the crisis or convalescent period of acute fevers, as malaria, scarlet and typhoid fever. Illusions, hallucinations, delusions of identity and great anxiety are the early mental manifestations."

In speaking of intoxication delirium Kraepelin¹⁸ says: "Although in general the practical importance of the intoxication deliria is small on account of its rarity, the scientific interest which they may claim is great, because just in these forms the causative dependence of very certain mental disturbances upon distinct chemical influences upon the cortex of the brain should be clear before us. It is true this claim is met only by very few forms of this deliria. Frequently we do not know even the chemical nature of the poison itself, in other instances its *modus operandi* upon the nerve tissue. Above all, this is true in regard to those intoxications which are directly or indirectly caused by micro-organisms, infections, diseases, etc."

Kraepelin¹⁹ says further: "A very important progress in the doctrine of the initial deliria is due to the fact that Nissl, in a case observed by me, could carefully examine the brain cortex. There was a considerable filling of all blood vessels, increase of leucocytes; above all, however, an extensive breaking down of the nerve cells, similar to that which is caused by artificial infection."

Kraepelin, speaking of the very extraordinary variations in the condition of nutrition of the patient and of the frequently observed continuous low temperature, says: "Just these latter points of view conduct one from the infectious diseases understood

as such to the diseases of metabolism in a more narrow sense, in which not external causes but internal disturbances in the organism create the noxious substance which infringes upon the condition of the brain or upon the working proceedings of mental events. We may expect that each morbid change in metabolism influences more or less strongly also the nutrition of the nervous system and, under certain circumstances, must allow material to enter the blood current and exercise a poisonous influence upon the same."

Speaking of affections of the digestive apparatus Kraepelin²⁰ says: "Disturbances of digestion, especially constipation, occur very frequently in fresh cases of insanity, but even they must be regarded as a consequence of the mentally caused irregularity of taking nourishment, and not as a cause of the same. If all mental work is very low, frequently a decrease of secretion of hydrochloric acid in the stomach seems to occur. Great variations in regard to the quantity of hydrochloric acid in the stomach are not rare in various mental disturbances. (*Leubuscher and Ziehen, Klinische Untersuchungen ueber die Salzsaurer Abscheidung des Magens bei Geistes kranken*, 1892.) Defective digestion of food must probably be assumed in cases, observed once in a while, in which the body weight will absolutely not increase in spite of the immense amount of nourishment taken in with great hunger. This occurs mostly in patients suffering from paralysis and katatonia. Parasites in the intestines can cause, it seems, in children a state of delirious excitement. Taken as a whole, we know very little which is certain in regard to these conditions."

Vaughan, Sr., of Ann Arbor, in the discussion of a bacteriological paper in this society, suggested that "possibly melancholia might be due to the splitting off and absorption of the poisonous group of the proteid molecule. This poison is slowly absorbed by the intestinal canal. It produces, in animals, marked depression and lowering of the temperature conditions which we find in melancholia." (letter).

Hill Hastings²¹ during the observations of a case of cerebral abscess of otitic origin, remarks in part as follows: ". . . Within 48 hours the stupor had gradually increased without any change in the general condition, and immediately operation was decided on. She could still be aroused to take nourishment,

void urine or answer questions. The necessity for an operation was explained and acquiesced in by her, rather mechanically, but without evident comprehension. . .

“ . . . On December 17, the day following the operation, a marked change was apparent in the patient's condition. She had had a good night, was perfectly conscious, had awakened surprised at her surroundings, asked how she got to the hospital. . . . Her last recollection was of the examination made of her eyes at the house, and she had a hazy remembrance of being carried somewhere.”

Voss²² speaks of the disturbances of consciousness in otitic thrombosis. According to Voss, they are explained by disturbances of circulation and pyemic or septic infection.

Powers²³ speaking of a case of mastoiditis with aberration of minds says: “Married woman of 24, admitted to the hospital. Previous history very incomplete. She is in a semi-conscious state, very irrational, opisthotonus; head turned to the right, pupils dilated but responsive to light, no strabismus, fundus oculi normal; pulse 94; abdomen rigid, recti abdominis contracted. Insertion of speculum into left auditory canal causes patient to shudder; showed no other sign of consciousness or intelligence. Walls of canal swollen, no pus. Paracentesis brought forth a few drops of pus and blood. For two weeks incontinence of speech, afterwards slight coma off and on. Lumbar puncture revealed pneumo bacillus in fluid, some microorganisms in ear secretion. Two weeks after admission opening into the antrum, which contained no pus, but masses of granulations. A few days after operation stupor, increased opisthotonus, on the seventh day patient is perfectly conscious, mind clear, uneventful recovery. Highest temperature 101° F.; highest pulse rate 110; leucocytes 5,200 to 7,000. Author delayed operation in this case on account of indefinite history, and the difficulty to differentiate between hysteria and non-otogenic meningitis. Also the poor condition of patient on entrance to hospital prevented narcosis and a radical operation.”

Kraepelin²⁴ says: “We may expect that conditions of dimness of consciousness as they restrict the collecting of outer experience also restrict the further use of the incomplete observations which could perhaps still be made, because the ability to renew them is here very small and quickly disappears entirely. As grave con-

ditions of dimness of consciousness are as a rule pretty sharply outlined as to the duration, gaps of recollection develop in this manner from which conclusion is mostly drawn that the consciousness is suspended during that period.

"Strictly speaking, the lack of recollection, the amnesia, is almost the only support which allows us with some certainty to consider a preceding loss of consciousness."

Strümpell²⁵ called attention to the so-called retrograde amnesia, namely to the loss of pictures of recollection for a certain period which had passed. He says: "These amnesias have been observed after injuries to the head, epileptic attacks, intoxications, etc."

The interesting relation between insanity and kidney disease is shown by Tuttle²⁶ in the McLean Asylum, Somerville, Mass. He quotes, among others, the following cases:

"CASE III. Mania With Distressing Delusions. No insanity in family. . . . On admission to the asylum the patient was in a state of considerable excitement. She soon mistook the nurses for people of her acquaintance who were acting as spies. She had quite constant false hearing—people upstairs were reading telegrams about her; there was a conspiracy to sell her house and take all her property; 'they' were about to publish an article in the newspapers, making all sorts of accusations against her; her food was poisoned, etc. She was in great distress of mind and showed it by her restlessness, flushed face, and mouth so dry that she could scarcely articulate. Sleep was gained only with hypnotics. This condition continued for a month; after that she gradually improved, and one morning suddenly realized that she had been sick and that the voices she had heard were not real. She was discharged recovered in two months.

"Repeated examinations of the urine showed the daily quantity to vary from 30 to 50 ounces, the specific gravity from 1.012 to 1.023. There was always a slight trace of albumin and a few hyaline, granular and occasional epithelial casts. There was no edema. There was a doubtful apex systolic murmur, not transmitted; no cardiac enlargement. There has been no opportunity for urinary analysis, but five and a half years later she was apparently in good bodily health.

"CASE IV. Mania with distressing delusions. . . . After admission the patient remained in about this condition for three and

a half months, somewhat confused, walking about from place to place, looking for the people whose voices she heard; sometimes noisy, usually not; eating when urged, but sparingly; sleeping with hypnotics; always, when awake, in a state of great agitation and distress of mind. The pulse varied from 80 to 110; the temperature from 98 to 100° F. Examination of the urine showed specific gravity 1,008 to 1,025; urea sometimes increased and again diminished; a trace of albumin; hyaline, granular and epithelial casts; free blood and renal epithelium. There was edema of ankles. Heart sounds were normal. In three months she began to improve in her mental condition; the edema disappeared and most of the casts. The mental gain was not all that could be desired, for she still had false hearing when taken, at the expiration of nine months, to an asylum in another part of the country. There was also a trace of albumin and an occasional cast. Fifteen months later her husband reported that she was well mentally and that there was no evidence of renal disease."

Class III (case 9) shows in my opinion a psychosis, the origin of which is not quite clear. Whether the psychosis would have occurred simply by intoxication if there had not been present a predisposition is open for discussion. We undoubtedly had a psychosis before us, whereas in Class II we had to deal only with mental disturbances, two conditions which must strictly be kept apart from each other.

To Class I or IV, or both, belong those disturbances which may be found directly or indirectly in connection with adenoids in the nasopharynx. Unfortunately I cannot remember where I found the statement that after an adenoid operation the mental status of a child improved so much that it could leave an asylum.

The aprosexia of Guye (the inability to concentrate the attention) is a well known phenomenon.

In an interesting article on deaf-mutism by Mygind²⁷ we find the following statement:

"All investigations concerning the subject show that hereditary deaf-mutism is an expression of congenital deafness, whereas the heredity of acquired deaf-mutism is less pronounced. But heredity is also of some significance for acquired deaf-mutism. Deaf-mutism shows itself in a still greater degree as a hereditary condition when one makes use of the conception

of heredity in order to explain in one family the frequent appearance of not only one and the same pathologic condition (homogenic heredity) but also of other conditions related to the same etiologically and pathologic-anatomically (varied heredity). It has been shown that various diseases of the middle ear and of the labyrinth occur with striking frequency among relatives of deaf-mutes, as do mental diseases, epilepsy, idiotism, stammering and other affections of speech, hysteria and other nervous diseases."

Hammerschlag²⁸ demonstrated an inmate of a deaf-mute institution suffering from hereditary degenerative deafness. The family history appeared to be negative. The child, eleven years old, had light blue eyes and showed a rotatory nystagmus in consequence of congenital amblyopia. The fundus was normal. The child had a very narrow forehead, a protuding upper jaw, an extremely high palate. The left testicle had not yet descended, and a white streak of hair ran from the forehead to the vertex. "The nerve status (Dr. Bonvicini) is in short as follows: The child had an uncertain broad-legged gait. The upper portion of the body wavers very distinctly forward and backward, but also sideward. When the child walks slowly it deviates very frequently to the right or to the left, so that the gait reminds one of that of an intoxicated person. The impression is created that it is more difficult for the child to walk slowly than to run, a condition which French neurologists have described under the name of 'Equilibre du vélocipède' (bicycle equilibrium) as concomitant symptom of cerebellar ataxy. These atactic people try to save the equilibrium by running instead of walking slow, which reminds one of the efforts of inexperienced bicyclists to maintain their equilibrium by fast riding, as it is known that slow riding is much more difficult than fast riding. The boy finished his run mainly by taking hold firmly of one of his comrades." "There was very faint patellar reflexes, it may even have been absent on the right side, normal Achilles tendon reflex, very out-spoken ataxia of the upper extremities, most distinct when he dresses or undresses. The boy is a complete idiot and proved to be incapable of education. . . ."

Nadoleczy²⁹ says: "The results of the statistics of Bruehl and Newratzki have already proven that the number of those who are hard of hearing is considerably larger among idiots than

among normal individuals. The aprosexia can, according to the views of the investigators, it is true, be added as a complicating circumstance. It shall, if present, be cured by removing the disturbances in the nose and ear, whereas the idiocy as such remains. In slight degrees of weak-mindedness the border lines can be made so uncertain that only the result of treatment can decide whether weak-mindedness or hardness of hearing, resp. nasal aprosexia, or combinations of these affections are present."

Class IV (cases 10 and 11) represents ear affections occurring during well defined and clearly recognizable psychoses.

Class V, accumulation of cerumen and foreign bodies. It is quite well known to us that the accumulation of cerumen causes sometimes more or less distress to the patient. Professor Victor Urbantschitsch³⁰ says: "A servant girl told me that she heard each of her thoughts plainly spoken and that she became very excited thereby. After a wad of cerumen had been removed by syringing, the hallucinations of hearing quieted down. Kessel found hearing hallucinations cured by washing out of cerumen from the left ear and tenotomy of the tensor tympani on the right ear. C. Meyer removed a wad of cerumen from a patient suffering from melancholia, whereafter the patient quickly lost the hallucination of screaming of a child and shortly recovered."

Related to these disturbances is that caused by a foreign body in the meatus. Urbantschitsch also mentions the fact that hallucinations of screaming people disappeared in a woman suffering from a chronic middle ear catarrh after he had removed the hammer.

It is of interest to learn how the subject matter appears to others. According to Ostmann³¹, a psychosis can be caused in various ways from the diseased ear:

"(a) Following the ear affection circumscribed hyperemia and exudations of the membranes of the brain develop which affect the gray substance of the brain. The mental disturbances caused hereby are described, without exception, as mania, states of excitement with lively motor impulses, visionary delirium and erroneous conceptions. (Wahnvorstellungen.) Not infrequently children become diseased in this manner.

"(b) The mental disturbance is set free by a pathologic reflex emanating from the ear. The reflex can exert its influence upon parts of the brain cortex either directly or, what would

appear to be more probable, indirectly. The psychosis is sometimes initiated by prodromal appearances. Especially frequently wads of cerumen may influence the mind in this manner through a pathologic reflex.

“(c) (In part) Subjective noises can cause psychoses: . . . Subjective noises and delusions of hearing can exist simultaneously independent of each other. We can only speak of hearing illusions, as Koepper says, when we can draw the conclusion that the illusion is directly dependent upon the tinnitus. Otherwise, we have before us a hearing hallucination. Entotic noises can cause psychoses in predisposed people. Not infrequently the unfortunate ones commit suicide.”

Also, we are confronted with the question when it is indicated to resort to surgical interference. An analogous question confronts the gynecologist. Dr. LeRoy Brown³² says, in part:

“There are, however, some facts which I regard as well established.

“1st. If the operation, when needed has been properly done and the patient has not been mutilated by an uncalled for castration, the mental condition is never aggravated by such a procedure. This, as stated, has been the experience of Manton, who has been operating for over twenty years, also that of Piqué, whose operations have extended over a period of twelve years, of myself in the entire range of my surgical work among the insane.

“2nd. There exists among the patients confined in the various insane asylums many who are suffering in a quiet, uncomplaining way from pathological conditions. They have a right to be given relief, irrespective of their mental state.

“3d. Under the stimulus of the improved somatic state resulting from surgical relief some of the patients show greater mental changes under the moral and therapeutic care than was shown before such a relief was given. At times this improved mental state continues to one of recovery.

“The primary object of surgical operations upon the insane should be to improve the physical status of the patient, with one end only in view, of relieving them of physical suffering and nervous disturbances. If as a result of this relief they are mentally improved, it is a sequel welcomed and for which the surgeon feels doubly repaid.

It appears to me that similar rules may hold good for the ear. Bryant's views in regard to tinnitus are mentioned before. At the same time we should remember that the proximity of the ear to the brain is of signal importance. If we can assume that an irritation of the brain, directly or indirectly, in predisposed or not predisposed patients, is caused by an infection which has its seat in the ear, the indication for interference is plain.

Mueller³³ speaks of the good influence of surgical interference on neurosis complicating ear affections, e. g., epilepsy, chorea minor, hystero-epilepsy. Of his ten cases, nine patients are reported improved, one cured. In a boy with a middle ear sup-puration and chorea minor, (operated upon in January, 1898) Mueller could report a complete cure also of his chorea (in 1902). He thinks the following points could be mentioned as essentially producing the good results: (1) The narcosis and the surgical shock. (2) The loss of blood. (3) The influence of the after-treatment, by which we mean the permanent drainage through the dressing.

Randolph³⁴ reports that "Twenty years ago Albert Robin touched upon that subject and that there was silence upon the subject for twenty years; that Toubert reported recently two cases, both affected with otorrhea. Toubert thinks that a sup-purating ear is undoubtedly a form of irritation for the brain, especially when there is strong tendency to mental troubles; furthermore, that this focus can be the cause of disturbances in the neighboring circulation, or can be the source of origin of toxins harmful to the nervous system. . . . A study of Toubert's observations would seem to indicate that in a certain proportion of cases disappearance of mental trouble has undoubtedly been brought about by the cure of concomitant ear affections."

Randolph reports two cases in which the mental attitude of the patients was changed very decidedly for the better after the cure of the otorrhea. He ends by saying: "Indeed, I think the matter of sufficient importance to warrant operative measures upon inmates of insane asylums who happen to be suffering from a chronic otorrhea which antedates the appearance of the mental trouble."

I should like to state that in connection with the subject matter of this paper, it is my opinion that in the toxemic exhaust-

ive and irritating conditions accompanying or following an inflammatory affection which has its primary seat in the ear, the patient must under certain circumstances, be considered belonging to the class of temporary mentally inferiors. This statement when first looked upon may appear a rather daring one. I am fully conscious of the fact that these conditions of mental inferiority differ from the mental inferiority as described by J. L. A. Koch to the same extent as an intoxication delirium differs from a delirium on a constitutional basis, e. g., the periodic delirium in the maniac form of periodic insanity (Kraepelin), yet there seems to exist in my mind the justification to give to the same an equal consideration in regard to the degree of responsibility as should be done in cases of mental inferiority. Koch³⁵ says in regard to the latter: "He who regards, however, the matter from the standpoint of medical experience, sees plainly that there exists a class of people who are insane and in whom, in consequence of diseases of the brain, the mental activity is influenced and disturbed in such a manner that the freedom of will is excluded, and that there are, on the other hand, people whose mental activity is intact in such a way that they have perfect freedom of will, but that there exists a class of people between these two groups, in whom there does not exist a complete lack of freedom of will but in whom deficiencies exist based upon organic pathologic changes, when the individual is confronted, in a given case, with the alternative to decide what is right."

Considering the many variations which might be construed as symptoms of mental inferiority, I admit one almost feels that there may not be a human being, especially not among those living in the complex organization based on what we term modern civilization, which may not at one time or the other exhibit symptoms differing from the average standard of culture which in itself is a partly arbitrary creation. We must be very careful and considerate in judging about these apparent exceptions and must remember that we are practically nothing else but more or less accurate and responsive reflex mechanisms of an ever changing quality.

While, in my opinion, an intoxication caused by an ear affection may only infrequently derange a mind to the degree equivalent to a condition met with in cases of outspoken insanity, I think that a condition resembling, at least in its outer aspects,

conditions met with in cases of mental inferiority, is not infrequently found, although it may only be of a temporary duration. This condition is present, however, at a time when a patient's consent to treatment is of great importance.

I am well aware that the subject is one touching upon two great realms in medicine, otology and psychiatry, two fields in which a great many questions have not yet been answered. When we consider the many various expressions of the human mind, in health, influenced by heredity, constitution, education, environment and the various ever-changing waves of bodily disposition, we can easily understand how much more difficult the explanation of abnormal mental and bodily phenomena may become in disease, especially when the recognition of the continual or fundamental pathologic state is difficult, or impossible and when the accessory cause, located in the ear, is sometimes just as difficult, or perhaps more difficult to recognize, and what is of still greater importance, when we must judge about the degree of disturbance which is to be held responsible for the result with which we are confronted. The situation becomes still more complicated if we take into consideration that the picture may be reversed in regard to the causative factor. The phenomena mentioned in some of the cases do not allow us to deny a priori the fact that the primary cause of a mental disturbance may be located in the ear. It is my opinion that an ear affection may start the vicious circle composed of the ear affection proper and e. g., the neurasthenic or hysteric conditions which latter, we know, may reach a form and a degree which sometimes allows us to classify the bearer even as insane.

In view of all the evidence, I may offer the following conclusions:

I. The ear participates in the production of mental disturbances, directly and indirectly.

II. As an organ of sense, its functional disturbance may disharmonize the normal state of thinking.

III. The mental disturbance can be brought about in two ways: First, by causing hallucinations, respectively, illusions, the influence of which is more or less strong according to the predisposition of the afflicted individual.

IV. Entirely different from these disturbances are those

in which the ear and its surrounding parts are simply the place in which a toxemia is primarily created, or in which an abscess engages the vitality of the body.

V. Both conditions (3 and 4), while entirely different from each other clinically and pathologically, can produce mental disturbances and aggravate pre-existing mentally abnormal conditions.

VI. It is very probable that also without a pre-disposition a mental disturbance can be created if, e. g., the annoying subjective noises create a state of exhaustion, e. g., neurasthenia.

VII. These conditions are of great import from a forensic point of view and must be considered in declaration of witnesses.

VIII. We are confronted with the important question whether the consent to an operation is required of an adult patient whose mental activity is temporarily interfered with and who is unable to judge about his condition, also if the consent of the relatives is necessary in such a case.

IX. The organs of hearing of inmates of insane asylums should be examined.

X. Patients suffering from mental disturbances who exhibit phenomena on the part of the organ of hearing should be examined not only for pathologic conditions of the ear but also of other organs, e. g., of the kidneys, on account of the fact that the disturbance in the ear, although in itself a new centre, may only be a reflex disturbance.

XI. The benefit of surgical interference in ear affections should be bestowed upon the insane in need of it.

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AMERICAN NEUROLOGICAL ASSOCIATION.

Thirty-Second Annual Meeting, Held at Boston, June 4 and 5, 1906.

The President, DR. HENRY R. STEDMAN, in the Chair.

(Continued from page 587.)

The Subdivision of the Representation of Cutaneous and Muscular Sensibility and of Stereognosis in the Cerebral Cortex.—By Dr. Charles K. Mills and Dr. T. H. Weisenburg. (See this journal, page 617.)

Dr. Morton Prince said that Dr. Mills and Dr. Weisenburg's communication was not only interesting, but important, both for the evidence they present for the subdivision of the cortical area for the stereognostic sense, and for the localization of this sense as a whole. These are two different problems.

The cases of Dr. Mills and Dr. Weisenburg, we are told, are the only ones on record with the limitation of this faculty to a part of the hand. Dr. Prince would not add any personal experience showing this limitation. He had, however, a case of astereognosis from tumor which he would like to take this opportunity of putting on record along side of Dr. Mills and Dr. Weisenburg's cases, as it bears on the second problem of localization of stereognosis and on the segmental representation of common sensibility in the cortex. The epileptiform attacks of pain, spreading from segment to segment of the body like motor spasms, are also of interest.

First, Dr. Prince merely suggested that logically stereognosis may well have a divisional representation; just as it is a function entirely confined to the hand, and does not exist, excepting possibly in a very primitive manner, in the foot or body. We may, of course, be able to recognize objects with the foot or toes, and an ape probably does, but this is by a logical process of inference or guessing rather than by a distinct stereognostic perception. If common sensation has segmental representation in the cortex, as Dr. Mills has insisted, as Campbell from his histological researches has strongly argued, and, as Dr. Prince supposed, has been maintained all along by those who believe in the central convolutions being sensori-motor, then we should expect that the stereognostic sense, theoretically depending as it does on the primary sensations, would be similarly represented. This view particularly harmonizes with Campbell's researches by which he has endeavored on histological and other grounds, to show that the postcentral gyrus is not only the seat of common sensation, but, in its posterior part, of the muscular sense and stereognosis. In amputation of the limbs, it will be remembered that he found changes segmentally focussed in this convolution, corresponding in location with those he found in the anterior motor convolution where they were limited to the centers for the amputated movements.

This histological evidence is not of course proof; it is only suggestive, but harmonizes with the view which Dr. Mills and Dr. Weisenburg advance on the strength of their cases.

The case which Dr. Prince reported,¹ so far as it goes, supports Campbell's contention for the location of the muscular and stereognostic senses in the postparietal gyrus as maintained by Dr. Mills. The interesting points of the case are: The limitation of the area of tactile anesthesia (from a cortical lesion) to a circumscribed region over the neck and face; the peculiar epileptiform diffusion of pain; the loss of muscular sense, and the astereognosis and muscular atrophy associated with a tumor, probably primarily located in the posterior central convolution, although eventually involving both central convolutions.

¹The case will be reported in full in this journal.

Yet it should not be overlooked that it is not possible to say that, through pressure, the tumor did not affect the parietal region.

Whether the complex function of stereognosis is to be located in the hinder portion of the postcentral convolution, as Campbell believes, or farther back in the posterior portion of the superior parietal, as Oppenheim and Mills hold, or between the two, is, in Dr. Prince's opinion, far from certain, and we are not entitled to speak dogmatically or categorically in the matter. The cases which Mills,² for example, cites in support of his contention in his recent paper, are open to two or more interpretations, particularly in the light of the new theory that the postcentral gyrus is sensory, and the motor area is anterior to the fissure of Rolando. An analysis of these cases shows:

(1) The symptoms in Oppenheim's case are explicable on the theory of pressure upon the postcentral convolution; which must have existed in fact, as there was paralysis, showing that pressure was exerted upon the precentral, and therefore *through* the postcentral.

(2) In one of the cases of Dr. Mills and Dr. Weisenburg there was also *hemiparesis*, and, as they report, the necropsy revealed a lesion which encroached upon the postcentral and precentral convolutions, diffuse meningitis being also present. Secondary degenerations due to these cortical lesions were also traced.

In another of Dr. Mills and Dr. Weisenburg's cases, in the absence of an autopsy, it is equally possible that the postcentral convolution was involved.

(3) In another case there was also *paresis* with early ankle clonus; and, although the tumor was found by Keen in the parietal region, it is possible that the astereognosis was caused—as, indeed, Mills must on his own views explain the loss of muscular sense—by pressure on the postcentral region or its neighborhood. How else explain the loss of muscular sense on his theory of its localization? and if the muscular sense, why not the astereognosis?

(4) In another case there was also *paresis* with increased reflexes, ankle clonus and Babinski. The loss of muscular sense and the astereognosis are therefore open to the same interpretation, though the tumor was found by Keen to be located "*in the main*" in the superior parietal gyrus.

(5) In another case the lesion was deep and invaded the subcortex of the postcentral, as well as that of the parietal region.

(6) Another case was also a "*subcortical postfrontal*," as well as parietal growth.

(7) Another case was a large parietal tumor with spastic hemiplegia (probably involving the internal capsule). It was not determined whether there were astereognosis and loss of muscular sense.

Dr. Spiller's³ three cases, analyzed, show the following: In one there was temporary hemiplegia which, clearing up, left an ataxia. Sensation could not be determined on account of the mental condition. At the autopsy there was a hemorrhagic area "about two centimeters or three centimeters" behind the Rolandic fissure—pretty close to eliminate involvement of the postcentral fissure, particularly as there had been hemiplegia.

In the second case there was astereognosis, loss of sense of position and impaired sensation for touch, but Dr. Spiller says that the postcentral convolution was involved in its extreme upper part by a tuberculous plaque.

In the third case there was paresis as well as ataxia and astereognosis, showing that the softening of the parietal lobe must have gone as far forward as the central fissure.

Astereognosis may have its seat in the posterior portion of the superior parietal lobe, but it is not on this kind of evidence that we are entitled to speak dogmatically. There may be other cases more to the point which

²University of Pennsylvania Medical Bulletin, April-May, 1906.

³American Journal of the Medical Sciences, February, 1904.

are harder to meet, but Dr. Prince had not attempted to go through the whole literature of the subject.

In his judgment it is still an open question whether stereognosis has its location in the postcentral, or in the neighborhood of the postcentral, or farther back in the parietal lobe.

Dr. Walton agreed with Dr. Mills regarding the separation of the different varieties of sensory representation and the separation of the cortex into definite regions. He did not, however, feel that Dr. Mills has quite established the seat of the stereognostic sense in the parietal region. Dr. Walton would like to remind the members of the theory suggested by Dr. Paul and himself a few years ago. Their idea was that just as kinesthetic speech memories are placed near the motor centers for larynx and tongue, just so the stereognostic sense which immediately precedes movement of the arm has its seat in close proximity to, but still separated from, the motor arm center. They reported several cases of postcentral lesion in which the stereognostic sense was lost, while tactile sense was retained; they had looked in vain for reports of similar dissociation in cases of parietal lesion. In all the cases reported by Dr. Mills and Dr. Weisenburg the association of astereognosis with loss of tactile sense is noteworthy.

Dr. Spiller referred to the pain described by Dr. Prince in his patient independent of the convulsive attacks. The pain occurred in the hand, extended up the arm and into the shoulder. He desired Dr. Prince to mention, if possible, whether the pain was confined to the ulnar side at the beginning of the attack, or whether the whole hand was involved. In the case of astereognosis from syphilis of the parietal lobe reported by Dr. Mills and Dr. Weisenburg, pain of one upper limb had been a persistent symptom. The patient had been under his (Dr. Spiller's) care off and on many years, and nothing seemed to relieve the pain in the limb. Pain from a cortical or slightly subcortical lesion is an interesting phenomenon. Dr. Spiller agreed with Dr. Prince in that he believed that at the present time we cannot separate the postcentral convolution from the parietal in their functional manifestations.

Dr. Knapp said in the first place he was very glad that Dr. Mills had at last recognized the case he (Dr. Knapp) reported some years ago, which he contested at the time. In the second place, to come back to the old question of stereognostic conception, he did not believe that cases of astereognosis have been sufficiently carefully analyzed to enable us to determine one particular point. We know, for example, in the more highly differentiated forms of auditory agnosis an apparent agnosis may be due to simple failure of sensory perception, as for instance, when we fail to recognize spoken language through the closed door, or fail to recognize conversation in a low tone. We must bear in mind that many of the forms of sensibility, particularly those forms of highly educated muscular sense as found in the fencer or expert billiard player, are beyond our methods of research; yet there may be so much blunting of perception that the special recognition of stereognosis may be affected. He did not think these cases have been sufficiently analyzed as yet to know whether there is true astereognosis or simply sensory impairment.

In regard to these definite areas, he felt somewhat skeptical. There is a process of education whereby the hand becomes the most highly educated part of our body, and the thumb and forefinger more than the other fingers. Clinically we find, for example, that in the ordinary cases of hemiplegia the blunting of sensibility is always more marked in the distal portion of the limb, gradually fading away, whereas in the hysterical cases and sometimes in organic cases, as in a case he showed a few years ago at the meeting of the Boston Society of Psychiatry and Neurology, we get the sharply defined anesthesia, but in the ordinary cerebral cases we get one which gradually fades away. That, he thought, is due to the fact of its being a

process of education, and the acquired forms of decay disappear in the most highly educated parts first.

Dr. Langdon said in regard to the subject of division and subdivision of the cortical areas that some years ago he reported the case of a man where the skull had been fractured in the post-parietal region, and the patient's stereognostic sense was affected. He could recognize some objects, but when he held a coin in his right hand he could only recognize it as a half-moon or half-disk. The experiment was tried again and again, but he persisted in the statement that he could recognize the coin as a half circle not as a disk.

Dr. Charles L. Dana thought this discussion ought not to be closed without speaking of the work of Dr. Campbell. It seems to him (Dr. Dana) that his work in this connection has gone a long way to determine the anatomy and functions of these regions.

Personally, he was not sure that the precentral convolution is the only motor area. At least he thought it is not absolutely demonstrated as yet. We should not forget that the anterior and posterior convolutions are very closely connected anatomically and physiologically. The posterior convolution is no doubt mainly a sensory area and may seem to consist of a different kind of cells than the anterior, but there is a very intimate association between the two convolutions. Dr. Sherrington told Dr. Dana that in his experiments he had found that when he stimulated a posterior central convolution (this part first) he did not get any reaction, but if he stimulated the anterior convolution first and then the posterior he got a motor reaction then. In other words, he did get movements from stimulation of the posterior convolution.

So far as the differentiation of the sensory areas is concerned, Dr. Dana was quite ready to agree with the general view of Dr. Mills. The only point he thought we might question is whether he has yet proved his special subdivisions.

One point more in regard to astereognosis. He agreed entirely with Dr. Mills that it is a co-ordinating faculty of the mind rather than a sensory process. Its loss is like that occurring in an aphasia. This view he advocated many years ago.

Dr. Weisenburg said that the pains complained of by Dr. Prince's patient were similar to those of case 1. Dr. Weisenburg believed that it was possible to have central pain due to an interruption of the sensory tracts anywhere in their course, and that he had cases proving this. He admitted Dr. Walton's criticism that there was always some motor involvement in the supposedly pure sensory cases, but thought this could be explained in the same manner as the paresis of the seventh nerve in involvements of the sensory fifth.

Dr. Mills said in closing the discussion:

He believed that the motor area was in front of the central fissure, and was one of the first to assert that it was so placed, although at first he did not put it entirely there.

With regard to Dr. Knapp he had never questioned his facts, nor his manner of presenting them, although he had sometimes his inferences. His case published in 1891 was clearly in favor of sensorial subdivisive representation.

Dr. Walton is simply getting the cart before the horse in his location of the sensory and stereognostic areas in relation to the motor zone.

With regard to the separateness of stereognostic conception and forms of sensation, it might be remarked that there was at the Philadelphia Hospital a case in which, although all the forms of sensibility were completely lost, the patient, if given sufficient time, was able to recognize objects by manipulation, the eyes of course being blind-folded.

With regard to Dr. Dana it should be said that he was one of the first to recognize the fact that the cortical representation of sensation like that of motion was subdivided; in other words, that there were sensory areas

and centers for the limbs, face and portions of these. Dr. Dana, however, like Horsley and others, held to the view that these subdivided sensory and motor areas were practically identical.

With regard to the work of Campbell, this had been fully recognized by Dr. Mills, as had also that of Grünbaum and Sherrington. Some of the experiments of the latter in particular would seem to point to centers in the sensory cortex correlated with special motor centers.

(To be continued.)

Periscope

Allgemeine Zeitschrift für Psychiatrie

(Vol. LXIII., No. 1, 1906.)

1. The Belief in Demoniactal Possession. BEHR.
2. Contribution to the Knowledge of Induced Insanity. AST.
3. The Pathology of General Paresis. LUKACS.
4. Combined Psychoses. STRANSKY.
5. Moral Imbecility. SCHAEFER.
6. The Kiss Among the Insane. NAECKE.

1. *Belief in Demoniactal Possession.*—The author describes the case of a woman, presenting a somatopsychosis, in whom probably abnormal sensations arising from the abdomen led to the elaboration of the delusion that an evil spirit inhabited this region and exercised his baleful influence over her. She could feel him plainly in her interior, and he spoke, not in her ear, but from her mouth loud enough for anyone to hear. When questions were addressed to the demon it was noticed that the patient's abdominal, neck and throat muscles were made tense, inspiration was controlled, and the reply was made in a forced explosive voice somewhat as in ventriloquy. The patient explained that it was her unwelcome guest who spoke in this way, using her speech organs. At times dialogues between patient and fiend took place, natural voice alternating with unnatural. In connection with this case, which the author is inclined to regard as one of dementia paranoides, he discusses the belief in witchcraft, and possession as it has come down to us from ancient times and persists in one form or another until the present day. He thinks that the value of spiritual exercises in the nature of exorcism should not be too scornfully rejected by physicians, since, while they cast out no devils, they frequently have a powerful suggestive effect, which might be legitimately made use of in suitable cases.

2. *Induced Insanity.*—Description of the cases of three married couples in which the mental disturbance of one partner was followed by that of the other, in two instances the wife being first affected; in the other, the husband. All showed delusions of persecution, and were probably examples of paranoia. From a study of these cases, and a review of the literature the author comes to the following conclusions: (1) There is no real transmission of a true psychosis. The primary case can only play the part of an exciting cause and determines only the form and content of the symptom-complex in the second psychosis. (2) As chief etiological factor "induction" comes into consideration only in what has been called "folie imposée." This develops chiefly in feeble minded persons or in those exceedingly amenable to suggestion, and recovery takes place as soon as the cause is removed. (3) Occasionally under special circumstances even normal people may give way under the influence of the insane, however. This influence may reach such a degree as to simulate a true psychosis, and differentiation may be impossible until the recovery takes place on removal from the unfavorable influence. (4) Transmission takes place not, as Schönfeldt thinks, in the reaction of a conformable disposition, but in pure suggestion, assisted by the combination of various factors.

3. *General Paresis.*—The author thinks that in the study of general paresis, attention has heretofore been directed too exclusively to the changes in the nervous system, while in reality it is being more and more widely recognized that this is a general disease affecting to a greater or less

extent all organs. He considers the etiology, pathology and pathological anatomy, basing his remarks chiefly on the results of the clinical and anatomical study of fifty cases of general paresis. Besides syphilis, he thinks that other factors, such as heredity or acquired degeneration, tuberculosis and other infectious diseases may play an important rôle in its etiology, and seems to lean toward the autointoxication theory. He summarizes his conclusions as follows: (1) The chief factor in the causation of general paresis along with heredity and acquired degeneration, is syphilis. (2) To the anatomopathological substratum of paresis next to the changes in the nervous system come atrophy and degeneration of the heart, of the vessels, the parenchymatous organs and the intestinal tract. These alterations at any rate in part are primary and not secondary to the changes in the central nervous system. (3) The symptoms of general paresis are due not only to the changes in the nervous system, and the circulatory and trophic disorders, but are in part of toxic origin.

4. *Combined Psychoses*.—The author discusses the views on this subject of various writers from Krafft-Ebing who first wrote about it, to Gaupp, who has furnished the most recent review of the question. The tendency of the last named as well as of the majority of recent authors to deny the possibility of true combination of psychoses he thinks too radical, since leaving out such occurrences as the onset of general paresis in an alcoholic subject who has already shown symptoms of alcoholic insanity, or of hysterical manifestations in a feeble-minded person. While rare, veritable combinations of unrelated psychoses occasionally occur. As illustrating this, he describes two cases, in one of which, a condition of delirium proceeding to death in marasmus, supervened on a paranoid condition in a middle-aged woman; in the other, a man twenty-three years old presented at the start a typical manic phase, followed by slight depression, which later gave place to katatonia. Neither of these cases would seem very conclusive, however, since in the first, the delusions of persecution present could readily lead to ideas of poisoning followed by abstinence, and the development of an exhaustion psychosis, while in the second, taking into consideration the protean symptoms of dementia præcox, the sequence of events described does not seem incompatible with the diagnosis of this psychosis.

5. *Moral Imbecility*.—Description of the case of a young man who, on account of some petty thefts and other irregularities at boarding school, came under the author's examination, with some remarks on the etiology and diagnosis of this condition.

6. *The Kiss Among the Insane*.—While the author considers the kiss as originating in the sexual relation, and that it is in its most common application a stimulus to sexual feeling, it has also acquired a significance as a symbol of pure asexual affection and of respect, in which its origin has been forgotten. Studying the motive of the kiss in the insane he finds it of the following varieties: (1) Purely friendly without sexual basis, only in women and some male idiots. (2) The sexual kiss not differing from the same in normal persons. (3) The homosexual kiss. (4) The imperative kiss in obedience to the command of a voice. (5) Caused by a delusion or a hallucination. (6) The impulsive kiss in obedience to an imperative conception. (7) The purely automatic kiss. He gives the histories of some cases illustrating these varieties, most of them being precocious demented, in some of whom the homosexual element was very prominent.

ALLEN (Trenton).

Journal de Neurologie

(Vol. XI., No. 1, 1906.)

1. A Case of Facial Tic Cured by Suggestion. IOTAYKO.
2. The Mathematical Analysis of Fatigue Curves as a Diagnostic Procedure in Diseases of the Nervous System. IOTAYKO.
3. Anesthetics. Particularly Scopolamine, as Adjuvants to Hypnotic Suggestion. BERILLON.

1. *Facial Tic Cured by Suggestion*.—Tics were formerly considered incurable, but the authoress thinks that we have now more efficacious curative measures in psychotherapy, and motor re-education. As illustrative of this she reports the case of a woman of twenty-two years of age in whom facial tics of eight years' duration were cured by suggestion. The patient presented a certain degree of mental backwardness and instability, and though having no marked nervous heredity, was the child of overindulgent parents in easy circumstances, and suffered from bad bringing up and defective control. After a two weeks' treatment by suggestion, while in hypnotic sleep the tics had disappeared, and while there was temporary recrudescence, the cure was made permanent by respiratory and reading aloud exercises and by an active and regular life with hygienic measures. In this case exercises of the facial muscles performed before the mirror, exaggerated the tics. For two years the patient has remained free from tic.

2. *Fatigue Curves*.—The authoress attempts to show that the mathematical study of ergographic curves can be made a procedure of practical utility in the diagnosis of nervous diseases, predicts for it a future, and urges its trial by other neurologists. As to the theory and laws, she refers to her brochure on "The Laws of Ergography." She claims by her method to demonstrate that alcohol is in small doses an aliment and increases muscular power that caffeine is an excitant, but no aliment, and states that by the study of the ergographic curves it can be determined whether the loss of power in a muscle is of central or of peripheral origin. Just how the latter decision is made possible, however, she does not make very clear.

3. *Anesthetics as Adjuncts to Hypnotic Suggestion*.—Patients may be classified as hyperhypnotizable, normally hypnotizable and non-hypnotizable. Under the last head will be found frequently cases in which hypnotism would be of most advantage. Since resistance to hypnotism is often due to an anxious or excited state, which prevents the patient being gotten into the condition of calm and mental and muscular relaxation which favors yielding to suggestive influence, it has been proposed to use beforehand small doses of ether, chloroform, morphine, chloral, sulphonal, &c. As these, however, present certain inconveniences, if not dangers, the author having notes that scopolamine in the minute doses of grm. 0.0003 to 0.0004 produces a condition of relaxation and somnolence akin to hypnotic sleep, was led to try this drug as an adjuvant in difficultly hypnotizable subjects. He finds that in the condition produced by scopolamine the subject is peculiarly amenable to suggestion, and recommends it as a "true psychological medicament."

(Vol. XI., No. 2, 1906.)

1. *Sensorial Aphasia with Right Lateral Homonymous Hemianopsia*. DEBRAY.
2. *Anatomopsychological Considerations on Dementia Præcox*. DE BUCK and DEROUBAIX.

1. *Sensorial Aphasia*.—A report of the following case with a discussion of its probable pathology. A man fifty-seven years old, while riding his bicycle, suddenly became confused, babbled a jumble of words. He did not fall, but could not longer guide himself. Consciousness was not lost. His pulse was tense and he had slight febrile movement, but after several days of appropriate treatment, had much improved. The author found him quiet and calm, the jaw had fallen slightly on the right side, but there was no trace of paralysis of the muscles either of the face or of the eyes except for a slight strabismus in the left eye, known to have been present long prior to the attack. All muscular reflexes were normal. The pupils were dilated, but reacted slowly for light and accommodation. The patient was found, however, to have a right homonymous hemianopsia, but preserved light perception in the affected retinal halves. He understood and replied to simple questions, read printed and written words though with some hesitation. He could write in his usual hand. Spontaneously he was unable to

translate any ideas either into speech or into writing, but could repeat several times a short phrase, or could write it, apparently without appreciating what he was doing. Unable to express his thoughts either verbally or graphically, he would stop and sigh. Analyzing the symptoms the author concludes that there was probably an embolism leading to destruction of fibers in the left occipital lobe, extending to and cutting off the connection of the angular gyrus with the motor tracts and motor centres of speech.

At no time was conjugate deviation of the eyes noted. Here the author enters into a discussion of the method of production of this latter symptom, as well as into that of the relation of the occipital cortex to the perception of light, color and defined images. In this nothing new is brought out.

2. *Dementia Præcox*.—The authors refer to the results of the histopathological examination of eight cases of dementia præcox recently published by them (Nevraxe III., 163), and make suggestions as to the bearing of this and other studies on some of the problems of psychology. In dementia præcox, they find the changes affecting especially the neurone, with secondary glia increase, while the vascular structures, also the nerve fibers, remain comparatively free from change. They would class it hence as a chronic parenchymatous cerebropathy, in contradistinction to general paresis, senile and organic dementia, in which the interstitial elements are most markedly affected. They have noticed that in dementia præcox the pathological changes are specially marked in the frontal lobes, but they could not convince themselves that they were at all confined to the association centres of Flechsig. They have, however, been struck with the difference in the degree of affection of the different cell layers taken vertically. Already Alzheimer and Dunton have noted that the deeper layers of the cortex, especially the layer of polymorphous cells were chiefly affected in dementia præcox. Our authors believe that they have noticed in the cases showing marked catatonic symptoms that the degeneration affected especially a layer of cells situated between the large pyramidal cells, and the polymorphous layer, while in cases which showed paranoid symptoms affecting especially the somatopsysche, there was an almost complete disappearance of the polymorphous layer. This brings up the question as to the relative functions of the different cell layers of the cortex. Comparing the results of other investigators with their own, they think that we may well ask, if perhaps the polymorphous layer may not have to do with the phenomena of somatopsychic sensibility and association, if the large pyramids are not in relation with the kinesthetic and the muscular and stereopsychic senses, and if the small and middle sized pyramidal layers have not a close connection with the superior senses of allopsychic order, and their associations.

(Vol. XI., No. 3, 1906.)

1. The Accommodation Reflex in General Paresis. DE MONTYEL.

1. *The Accommodation Reflex*.—To solve the question as to what extent and how frequently the pupillary reaction for accommodation is affected in general paresis the author thinks that the only satisfactory method is that of taking a number of cases and following them through the whole course of the disease, noting continually the state of the accommodation reflex. This he has done in 140 cases, with the following results: Fifty of the patients died in the first stage of the disease, thirty-six in the second, leaving fifty-four to make their exitus in the terminal stage.

The following table shows the state of the reflex in the different stages of the disease:

	First Stage.	Second Stage.	Third Stage.
Always normal.....	66=47.46%	34=33.04%	2= 3.70%
Always abnormal.....	23=16.33%	24=26.44%	43=79.85%
Normal then abnormal...	27=19.16%	18=19.90%	3= 5.55%
Alternately normal and abnormal	24=17.04%	14=15.54%	6=11.10%

He draws the following conclusions:

(1) In any case of general paresis running its complete course the accommodation reflex is never either always normal or always abnormal, but is invariably altered at one time or other. (2) In the majority of cases the accommodation reflex is simultaneously affected in both eyes, or at least both eyes are affected by a similar alteration, usually a diminution of the reflex, though its exaggeration is occasionally observed. (3) In the two earlier periods, the tendency is rather to enfeeblement than to abolition of this reflex. In the end stage there is greater tendency to its abolition. (4) The rule is successive enfeeblement in at least two stages. (5) In the first period the accommodation reflex is altered in one half the cases; in the second is two-thirds; in the third, normality is altogether exceptional, though it may be present. (6) Exaggeration of the reflex occurs when at all, only in the first stage. (7) Abolition of reflex is probably never produced at once, but always in successive stages. (8) The two stages of alteration generally coincide with the progress of the disease, enfeeblement being the rule in the earlier, loss of reflex in the later period.

(Vol. XI., No. 4, 1906.)

I. Contribution to the Diagnosis of Mental Irregularities. The Anthropometric Frontiers of the Abnormal, After Binet. DECROLY.

1. *Diagnosis of Mental Irregularities*.—After referring to a previous communication made by him on this subject, the author gives in tabular form the results of his examination of thirty-three children, pupils of a school for the backward, and coming from a better social stratum than those forming the basis of his earlier paper. He concludes, that anthropometric measurements confirm the conclusions of Binet. Among twenty-two of the thirty-three children, showing decided intellectual inferiority, twelve showed measurements below Binet's frontier for the sum of the cephalic diameters, in three they were very near it, and in one case at the superior limit. As to stature, five were below Binet's limit. Among the eleven other children, none gave measurements below the limit for the sum of the cephalic measurements, one only was below the height limit. These investigations confirm the fact that there is also an upper frontier for head measurements, but figures beyond this, less necessarily imply mental inferiority, since the enlargement may sometimes be due to causes external to the brain, and as a fact some hydrocephalics are intelligent. For an anomaly of the cranium, a cause must act either before or within a short time after birth. In estimating each individual case it is necessary to remember that inferior height may be due to cerebral lack of development, or lesion or to general nutritional trouble. The relation between height and cranial measurements is of less importance, than that the latter are up to the standard. Only six of the author's cases fell below the height standard, while there were twelve having the sum of the cranial measurements below the frontier, and of these twelve, but four were under height.

ALLEN (Trenton).

Journal de Psychologie Normale et Pathologique

(Third Year, No. 1. January-February, 1906.)

1. A Tentative Classification of the Disorders of Pantomime Among the Demented. G. DROMARD.
2. The Physiological Explanation of Emotion. G. R. D'ALLONNES. (Continued.)
3. Example of Psychomotor Induction in a Cat. CH. FÉRÉ.
4. Hypochondria. PIERRE ROY.
5. Two Cases of Temporary Mental Disturbance That Were Highly Suggestive of Simulation. P. JUQUELIER.

1. *Classification of the Disorders of Pantomime*.—The study of the pantomimic manifestations of the demented is a recent one, and thus far writers have singularly limited themselves to the mere description of them. No attempt at classification is to be found in any of the general works in

which, nevertheless, much space is devoted to the portrayal of the facial expressions, gestures and attitudes of the insane. In the present article, which is to be followed in the course of the year by two more elaborate ones, Dromard offers a tentative classification and explains briefly the basis wherein he constructs it. He postulates that, like the physiological function of verbal speech, there is a distinct, specific function of pantomimic speech. They are both forms of language; and both verbal speech and gesture are evolved in response to the same needs. They are likewise both dependent upon special centres; those of the former being located in the cerebral cortex, those of the latter in the basal ganglia, especially the optic thalamus. Pantomimic manifestations are characterized by both qualitative and quantitative attributes, but it is always vague and profitless to speak of mere hypermimia or hypomimia, of increased or diminished pantomimia. The function and its exhibitions are pathological only when the expression of the face, the gesture, the attitude is irrelevant, inadequate or inappropriate to the idea or emotion which it accompanies, no matter if that expression, gesture or attitude be quantitatively insufficient or excessive, or if it be qualitatively contradictory or simply discordant. It is the relationship between the thought in the mind of the patient and the accompanying gesture that determines the normality or abnormality of the latter. The latter may seem very inappropriate to us, and yet were we in complete comprehension of the patient's inner consciousness at the moment it would be found to be perfectly in accord. Hence it is of no consequence to say merely that the gestures are exaggerated or diminished, that they are not in accord with the commonly accepted modes of gesture. The examiner must first learn the patient's state of mind, both as to ideas and emotions, and then determine the utter inappropriateness of the intended, associated gesture before he can pronounce the latter a sign of disease. Pantomimic manifestations may be grouped first under two general heads; the *voluntary or active movements* (ideative pantomimia, in association with the intellectual life) and the *involuntary or passive movements* (emotive pantomimia, in association with the affective life). The man, for instance, who laughs by means of his higher psychic centers is not the man who laughs by means of his lower thalamic centers. To be able to distinguish the former from the latter by objective manifestations is to possess the art of knowing how to detect simulation. The disorders in the sphere of ideative or voluntary pantomimia are to be credited to the disturbance of the associations which depend upon the connecting links that normally unite thought with its appropriate motor expression. Of these disturbed associations there are two great groups; first, where the adaptation of the motor manifestation to the accompanying idea is wholly wrong and vicious (paramimic asemia in aphasics, mannerisms in hysterics and hebephrenics, and pantomimic neologism in those who retain conventional gestures that are inappropriate to the idea that is present); and secondly, where the adaptation of the motor manifestation to the thought is merely faulty, the higher mind withholding its normal control over the motor phenomena which in turn then becomes automatic (secondary automatism as seen in stereomimia and primary automatism as in echomimia).

The disorders in the sphere of emotive or involuntary pantomimia involve, like the preceding, disturbances of adaptation, but in the latter there is noticeable a disturbance more of a physiological than of a psychological character involving the basal ganglia. They are distinctly functional in origin. They may be divided into two general groups; first, those involving the cortical centers of the ideo-affective associations (paramimia as observed in dementia præcox); and secondly, those involving the thalamic centers of the psycho-reflex (spasmodic pantomimia from failure of inhibition, dissociated pantomimia from dynamogenic failure).

2. *The Physiological Explanation of Emotion.*—To be continued.

3. *Psychomotor Induction in a Cat.*—This is a detailed account, by Féré, of how one cat watched and instinctively, closely imitated the actions

of another cat, in order to show what he means by the term "psychomotor induction," apparently a form of psychic suggestion, and to demonstrate that as an elemental phenomenon it exists in the lower animals as well as in man.

4. *Hypochondria*.—Roy discusses and contrasts the two prominent doctrines as to the origin of hypochondria; namely, the psychic doctrine (Dubois) and the visceral (Head, Gamble and others). He concludes that there is no such thing as a purely psychic, ideogenic hypochondria; nor on the other hand is there a purely symptomatic hypochondria wherein a visceral or other peripheral disease can be said to so affect a perfectly healthy brain. For the evolution of hypochondria two conditions are requisite; namely, a special psychopathic constitution and some form of cenesthetic disorder. The latter is due to some visceral or other peripheral disability and is often amenable to treatment; the former is more difficult of management because it is more or less due to heredity and requires a most energetic course of psychotherapy. As a distinct malady due to a specific, etiological factor, hypochondria does not exist. It is merely a state of mind symptomatic of some preceding diseased condition.

5. *Temporary Mental Disturbance Suggestive of Simulation*.—Juquelier warns against the making of hasty diagnoses and cites two cases of persons that under superficial examination were supposed to be more or less malingerers, but upon further information were shown to be the victims of temporary mental aberration.

The first case was that of a traveling merchant who was robbed by confidence men of a large sum of money. Stunned and chagrined, he suddenly lost all control of himself, wandered aimlessly toward the river with the vague purpose of drowning himself, was arrested and subjected to a severe police examination, and proving obstreperous was put down as a simulator. He might have even been considered as a criminal and as a co-conspirator with the confidence men. After a few days he seemed to lose his obstinacy, and in his own native German freely gave his name and all needed information in regard to himself. It ultimately appeared that his memory was a blank as to his doings from the time of the robbery until the time that he seemed to come out of a sort of hypnotic state and give his name to the officials. He had no recollection of his attempt at suicide, his arrest or obstinacy.

The second case was that of a woman who, upon arrest, assumed a bizarre attitude, was insolent, extravagant, puerile and in every way acted so that one could hardly help thinking of malingering. She ultimately proved to be an illiterate hysteric, and what was thought to be mere exasperating obstinacy and wantonness on her part was really a manifestation of a hysterical attack.

As Juquelier says in his brief study of these two cases the differentiation of disease from simulation is easily made if one remembers that hypothermia, coldness of the extremities, modifications of the pulse and respiration cannot be artificially produced so as to cause them to appear as they do in certain diseased states. Simulators as a rule overdo their parts. The imitator of maniacal excitement exaggerates her incoherence and failure of attention. One who is maniacally excited is not amnesic. Moreover, with such a one, it is often possible to interrupt by a question the deluge of words indicating an intellectual overactivity, to obtain a reasonable response, and to construct a history of the disease.

(Third Year, No. 2. March-April, 1906.)

1. The Disorders of the Musical Language Among Hysterics. INGENIEROS.
2. The Physiological Explanation of Emotion. G. R. D'ALLONNES.

(Concluded.)

1. *The Musical Language Among Hysterics*.—Ingenieros presents rather an elaborate study of hysterical dysmusia and reports a number of interesting cases of this somewhat new clinical group.

The musical aphasias or amusias constitute the fundamental clinical type and when they are of hysterical origin, are always accompanied by other well-known stigmata and accidents of hysteria, especially hysterical mutism. Under such circumstances the condition is one of complicated or combined hysterical amusia. Sometimes, however, the disorder is limited to the musical sphere entirely, there being no alterations in the sphere of ordinary language in any of its forms or manifestations. The latter is a condition of pure hysterical amusia. From his own clinic the author reports in detail three cases of pure hysterical amusia and says that his search through the literature has failed in discovering any others.

The first case was that of a young man twenty-five years of age, unmarried, a student of law, living in comfortable circumstances. His general history reads like that of the average, precocious psychoneurotic. His first hysterioepileptiform seizure occurred when he was sixteen. It, as well as those that followed, was of the nature of a temporary psychic absence. As a student of music the young man had attained a notable degree of proficiency both in the execution and the comprehension of the art. One evening he went to his piano as usual to play, but remained perfectly immobile without knowing what to do. It seemed to him, as he expressed it, as though "his memory had fled from his brain." He picked up some printed selections to try, but could not remember or comprehend the meaning of the lines with the notes and marks upon them. Surprised at all this, he endeavored to recall mentally and to whistle the beginning of some of his favorite melodies. He could not do it. He had clearly lost his musical sense or language completely in all of its forms and modes of expression. The careful examination of the patient soon after this by the author discovered many typical stigmata of hysteria. There was no change in his general intelligence, volition or emotionality. His character and conduct were as usual. His mental state was the familiar one of the average neuropath. In regard to music, however, it was found that he could comprehend absolutely nothing. He could neither perform nor understand written music. He was not able even to recognize or comprehend music when it was produced vocally or instrumentally by someone else. It was impossible for him to represent mentally to himself a single musical phrase. The patient declared that "he heard the music as one would hear the sounded words of a language which he was totally ignorant of." He retained only the conception of rhythm, but it was exclusive of all possible relationship with melody or harmony; it was merely the rhythm of noises and nothing more.

There were no other indications of the disturbance of languages; no apraxia; no amimia; no dysphonia, dyslalia or dysarthria. The author sought in vain for the least sign of dysphasia, verbal deafness, alexia, aphemia or agraphia. The man was clearly the victim of a pure and complete amusia of hysterical origin. Full recovery took place after a few months steady and persistent re-education of the musical faculty. He was able to perform and intelligently interpret at the end of five months his favorite repertoire from Bach, Beethoven, Liszt, Brahms, Mendelssohn and Chopin.

The author's second case, not so fully reported as the first, was that of a woman twenty-two years of age, with a frank neuropathic, hysterical record. Mutism had occurred and this, of course, slightly complicated the linguistic stigmata. Once before her marriage, at the age of twenty, she had a hysterical outbreak while performing upon the piano. She was unable to continue her playing because all of a sudden she ceased to hear what it was that she was playing. It seemed to her that the sounds were mere percussion notes "as if she were performing on a piano that had no strings." This observation was made by the patient upon the very day of the hysterical attack, but as she played from memory, and only moderately well, it was no hardship for her to give up her playing. This condition lasted for more than a year. Afterwards she recovered her auditory

musical sense, but very imperfectly, so that she was not able to perform upon the piano on account of the inadequacy of her hearing.

In addition to the above, the author learned from his own personal investigation that the patient was wont to play from memory; that is to say, she was a "musical illiterate." Her musical language included the three functions, singing, hearing and instrumental performance. Reading and writing were wanting. She preserved the ability to sing and to play by means of her muscle-memories; but she neither comprehended nor heard what she sang or played. The loss of her auditory musical sense was complete for all forms of instruments and all sorts of voices. She was subject to "tonal deafness" like those individuals who have been named "musical idiots." The etiology and evolution of this case was most distinctly hysterical.

The third case was that of a young woman whose father and brothers were pronounced neuropaths. Her own history was typically hysterical and takes cognizance of convulsive seizures, paroxysmal attacks of laughing, instability and originality of character, and most singular tastes. She obtained a mediocre musical education, and played the piano from memory as well as from studious application. After her first confinement, which was not at all a difficult one, she suddenly lost all memory for instrumental performance. When she wished to play the piano she could not succeed in moving her fingers over the keyboard. On the other hand, she sang easily and was able to write music perfectly. She comprehended the music distinctly; she heard and read it with her usual facility. The only centre which apparently did not functionate was that of the psychic motor representations for technical performance; the centre for song language and that for musical writing, both motor, worked normally. The sensory auditory and visual centers revealed no disorder. Ordinary language was normal in all of its various modes of expression. Hence the patient presented a clear illustration of pure motor amusia under the form of an instrumental aphemia. Re-education in this case brought about a rapid restoration of the function.

In conjunction with these three pure types of amusia, the author reports a number of cases of incomplete or partial amusia. A classification is suggested and the whole subject is interestingly and quite exhaustively treated.

2. *Physiological Explanation of Emotion.*—The theory of James, Lange, Sergi and others holds that the affective state is the resultant of somatic, motor and sensorial sensations which are not affective in themselves, but which give rise to emotion through their relationships, their accumulation, their confusion, their inadaptation. This makes emotion *relational* in character and not specific. According to the intellectualistic theory, on the other hand, emotion is merely a sudden charge in the intensity, the liveliness, the course of the mental acts of consciousness. This theory, like the former, denies the specific character of the emotional state and postulates its dependence merely upon the interaction of mental representations. Sallier has fused together, as it were, the James-Lange physiological theory and the intellectualistic psychological theory by maintaining that pure mental representations, being the result of cerebral activity, are no less physiological manifestations than are ordinary sensory and sensory-motor phenomena; and by arguing that their mutual interaction gives rise to emotion quite as much as does the mutual interaction of the sensations. d'Allonnes invokes the results of certain recent experiments upon animals obtained by Bechterew and by Sherrington, and his own study of a remarkable clinical case, to show the intenable of both the above theories when either is adopted as the sole explanation of the nature and origin of the emotions. He maintains that a broader view of the emotional state will harmonize both theories and recognize the truth in both. He finds that the affective phenomena appear as distinct, specific presentations, having for their special physiological basis visceral phenomena. The in-

ternal somatic sensations are necessary and adequate conditions for the existence of the affective state. In the absence of these sensations, other sensations and representations, whatever may be their combinations and modes of discharge, do not attain to the point of provoking emotion. Visceral anesthesia leads to unemotionalism; under which circumstances pantomimia, the cognitive, and active processes exhibit themselves much in the same way that they would were a true emotion existent. As opposed to the teachings of James, Sallier and intellectualism, the facts cited by the author lead him to the drawing of a sharp distinction between inclination and emotion, and a visceral theory of emotion. He thinks that there are three forms or types of emotion, each with its own particular modes of expression. He names them the *shack-emotion*, the *inclination-emotion* and the *inmotive-inclination*. The last especially does he dwell upon and declare that it has been largely overlooked in most of the hypotheses advanced to explain some of the outward manifestations of the affective state. The visceral conditions and other physiological requisites insisted upon by James and those who adopt the theory of the peripheral origin of the emotions are not needed for the manifestation of the inmotive-inclination.

METTLER (Chicago).

Miscellany

PRELIMINARY STUDY OF NERVE TISSUE DEGENERATION. Koch and Johnson (Am. Jour. Phys., XV., No. 111, 1906).

1. Degenerated nerve tissues contain less solids than normal, owing to the fact that as the cortex wastes away cerebrospinal fluid partially takes its place and renders the tissues more watery. Barrat mentions the same observation in his paper. Edema may contribute to this.

2. Nucleo-proteids are increased, owing mainly to the presence of large numbers of leucocytes proliferating blood vessel elements and neuroglia cells.

3. The average and the minimum results indicate little or no change in lecithins, cephalins and sulphur compound (combined) in the prefrontal, as well as the motor areas, which cannot be accounted for by variations in the material. The increased amount of cerebrin in the motor area (degenerated) indicates that these samples contained a larger mixture of white matter.

4. The experimental degeneration produced by cutting the cord of a dog and allowing it to degenerate nineteen days gives results on chemical analysis, which resemble the degeneration of general paresis. There is a similar increase in the amount of water and nucleo-proteid, and comparatively little change as regards the relative amount of other constituents.

5. Barratt's interesting observation that the percentage of total phosphorus in normal and degenerated brains is the same, is here only partially confirmed. The relative amounts of the alcohol, ether, soluble phosphorus compounds, the lecithins and the cephalins are indeed practically unchanged, although their absolute amount is much reduced. The interesting increase in nuclein phosphorus entirely escaped his attention.

6. The absolute amount of lecithins, cephalins and cerebrins and sulphur compounds must be very much reduced in general paralysis, their proportions relative to one another remains, however, practically unchanged.

7. In conclusion, it is interesting to note that the nervous system, more than any other tissue, both in pathological and experimental degeneration, tends to keep its relative composition constant, which observation is in harmony with the results obtained in starvation.

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Original Articles

THE CEREBRAL ELEMENT IN THE REFLEXES, AND ITS
RELATION TO THE SPINAL ELEMENT.*

BY G. L. WALTON, M. D.,

OF BOSTON.

PHYSICIAN TO NEUROLOGICAL DEPARTMENT, MASSACHUSETTS GENERAL HOSPITAL; INSTRUCTOR IN NEUROLOGY, HARVARD UNIVERSITY.

AND

W. E. PAUL, M.D.,

OF BOSTON.

ASSISTANT PHYSICIAN, NEUROLOGICAL DEPARTMENT, MASS. GENERAL HOSPITAL.

The acceptance of the brain as playing an active part in the production of the reflex has been perhaps hampered by theories regarding the various levels involved. The purpose of this paper is, after briefly reviewing the principal steps in the discussion, to present a practical working hypothesis. We hope it may aid in paving the way for a theory which shall embody the results of extended observations unhampered by the old instruction, instruction based upon the supposition that the human reflex is practically that of the frog, instruction the simplicity of which renders it attractive but the application of which leads the student into difficulty.

It is no wonder that authorities are not yet united on the seat of the (so-called) reflex mechanism when they are still at variance on such a fundamental proposition as whether in fact, loss of reflex is the rule or the exception in recent apoplexy and allied conditions, in which the cerebral influence is cut off. We shall cite from our own recent experience a series of cases **which tend**

*Read at the meeting of the American Neurological Association, June 4 and 5, 1906.

to show that immediate lessening and loss of reflex in the paralyzed part is the rule, as Pandi stated in 1895, in apoplexy and allied states.

Prior to the observation of Bastian and others that abolition of the reflexes followed complete destruction of the upper cord, the theory of their mechanism and seat was a simple one. They depended, namely, upon the integrity of a spinal arc, were inhibited by the brain through the pyramidal fibres, and became exaggerated upon the withdrawal of this inhibition.

This simple theory, deduced many years ago from observations on the frog, and applied practically unmodified to the complex human organism, long served for purposes of instruction, and for the explanation of reflexes disordered by disease. Among the ingenious applications of the theory was the explanation of lessened reflexes from cerebral disease as due to destruction of still higher centres which inhibited the inhibition of the reflexes (Gowers). Such suppositions must be abandoned when it appears that the reflexes disappear when the cord is entirely severed from the brain, and thus freed from inhibition as well as from inhibition of inhibition.

The suggestion that shock to the spinal centers may explain the lessened reflexes in cerebral disease has been opposed by Stewart and Turner, Pandi and others. The following fact, which we have repeatedly verified, tends to eliminate shock. Given a case of apoplexy or of broken neck in which the reflexes are abolished and it will be found that the electrical reactions are quite unaffected, until the gradual lessening of electrical irritability which Shirres finds occurs about eight days later in the cases resulting unfavorably. This shows that the mechanism presiding over the electrical reaction is unaltered at a time when that presiding over the reflex* is placed entirely out of commission. If shock has destroyed the activity of the one it should surely to some extent at least affect the other.

The next step was to assume that the so-called centers of the reflexes had ascended in man to the brain (Crocq, Grasset, *et al.*). Crocq, in explaining the varied alterations of superficial and of deep reflexes in disease, went so far as definitely to place the centers for the superficial reflexes in the cortex, and for the

*Without committing ourselves to the acceptance of true reflex element in these phenomena, in fact rather favoring the view that they are merely exhibitions of tonus, we use the current term for convenience.

deep at the level of the red nucleus. Grasset's modification of this theory assumed that there are in man at least three regions, namely, spinal, basilar and cortical, all of which are possessed of centers for tonicity and reflex, all normally in play in the healthy adult, the higher supplementing and controlling the lower more and more as the animal scale is ascended, though not absolutely replacing them as claimed by Crocq.

It was certainly a step in the right direction to credit the brain with playing a part in the production of the reflexes, instead of merely inhibiting them, but Grasset failed satisfactorily to explain the exaggerated reflexes of pyramidal disease.

Already, in 1895, Pandi¹ credited the cortex with being the seat of the entire reflex mechanism, both deep and superficial, explaining the difference between them on the ground that the simplest and most easily excited (the deep reflex) became more prompt through frequent repetition. He quotes Jendrassik and Geigel as having in 1886 and 1892, respectively, determined the cortical origin of the skin reflexes based on clinical and experimental evidence. He explained the increased reflex of old hemiplegics by interference with the spread of the excitation among the association fibers thus leaving the main path to work more freely. He explains the hypertonia, contractures and allied phenomena in the same manner and regards the tendon reflex as merely a sign of increased cortical tonus.

But it is hard to reconcile the pathological variations of the reflexes with this theory. For example, after hemiplegia, when the skin reflexes return they should, by his assumption, become active, like the deep reflexes, whereas they are more faint and sluggish than ever, showing that their control is entirely different from that of the deep reflexes. Again, Pandi's theory hardly explains the increased deep reflexes which result from local disease of the pyramidal tracts. In this case the association fibers of the cortex are unaffected, so that the reflex should be deliberate and rather lessened than increased by the impaired transmission.

In a recent contribution Pandi takes the view that the lesion in case of increased reflexes is irritative and that in a non-irrita-

¹Pandi: "Der corticale Mechanismus der Reflex-phänomenen." *Arch. f. d. des Physiol.*, 1895, LXI., 465-474; also *Neurologisches Centralblatt*, No. 10, 16 Mai., 1905.

tive lesion impeding the tract the reflexes are lessened. This would seem a difficult proposition to establish, and his position is here open to comment that the skin reflexes should also be exaggerated in irritative lesions, which is by no means the case.

The question has been reopened by Rose² who draws his conclusions from the study of the various theories, from experiments on animals and upon extended clinical observations. This author postulates a longer arc with its controlling center in the brain. In his conclusions he assumes either that the brain centers exercise a stimulating action on the ganglion cells of the cord, or that the normal tendon and skin reflexes make use of the longer paths, and that if protective reflex movements and plantar reflexes are retained in disease of the brain, they make use of the shorter paths. He is apparently still influenced by the old teaching that a reflex must pass through, and be controlled by, a single arc. His hypothesis makes no provision for a combined control with varying preponderance of one or the other element.

Such combined control seems to us not only to explain best the variation in the healthy reflex and its alterations in disease, but to fall in line with the modern view of the co-ordinated functioning of the central nervous system in general.

The following comparatively simple proposition seems the logical outcome of the line of thought we have followed. *Both the brain and the cord must play a part in the production of the deep reflexes. The higher arcs tend to produce a more subdued and deliberate reflex, while the lower arcs tend to produce an active, instantaneous and violent reflex. In health the resultant is a comparatively moderate reflex, varying in different individuals as the cerebral or the spinal type predominates. In organic disease the partial withdrawal of the cerebral influence causes the spinal type of reflex, namely the exaggerated reflex. The spinal arc is, however, incapable of alone sustaining the function as shown by the fact that complete withdrawal of cerebral influence causes abolition of all reflexes.*

It is now generally agreed that sudden destruction of the upper cord abolishes the reflexes. There is still some difference of opinion on the question whether upon the *gradual*, complete withdrawal of cerebral influence reflexes may not be preserved as claimed by Raymond and Cestan.

²These de Paris, 1905.

The early appearance of the Babinski reflex in broken back when other reflexes are abolished (Stewart and Turner, Walton) has led one of the writers to allow that this reflex was purely spinal. But in a recent case (case 12) of crush of the cervical cord with abolition of all reflexes during the two days of life, the Babinski failed to appear. This observation has been verified in a number of instances by Shirres. Such observations would suggest that even this reflex requires some degree of cerebral influence. This may furnish an important aid in the diagnosis of complete from partial crush of the cord.

The control of the superficial reflexes varies somewhat from that of the deep reflexes. The disappearance of the superficial reflexes after the cerebral lesion indicates cerebral control; the fact that they do not become exaggerated in disease of the pyramidal tract shows that they have little if any representation in the spinal cord.

The control of the Babinski reflex more nearly approximates that of the deep than that of the superficial reflexes.

The text-book instruction varies regarding the condition of the reflexes in the initial stages of apoplectic hemiplegia from the statement that the deep reflexes are increased, the superficial usually diminished (Osler) to the recognition of lessened reflexes as the usual custom (Oppenheim, Dana). Mills (1897, p. 247) takes, perhaps, the most common view, namely, that while the superficial and deep reflexes may be depressed or absent in the early hours this is not the rule, at least for the latter, and that probably it is most common "that at first the skin reflexes are abolished and the muscle jerks are increased."

As a contribution tending to establish the rule, the following cases coming under our observation during the past year are recorded. It will be seen that out of 13 cases of cerebral apoplexy and cerebral trauma, in 8 there was lessening of reflexes on the paralyzed side; in one additional case the reflex was lessened in the part earliest and most completely paralyzed, and increased in the other paralyzed parts.

In one case, further, of depressed fracture in the lower Rolandic area, there was lessening of the knee-jerk on the paralyzed side and increase of the Achilles reflex with ankle clonus.

In one case, again, the superficial reflexes were absent, the deep exaggerated on the paralyzed side.

In the remaining two cases there was increase of knee-jerk on the paralyzed side. These two cases were first seen 8 and 22 days respectively after the apoplectic attack, so that even here it is by no means certain that the reflex was increased from the first.

The history of the 13 cases is briefly appended.

In the following cases there was *lessening* of reflexes on the paralyzed side.

CASE 1. Woman about 65—apoplectic shock some days ago. Right hemiplegia. Knee jerk moderate left, absent right. Achilles active left, moderate right.

CASE 2. Man, 63. Apoplectic shock with right hemiplegia. Examined one hour later—unconscious, breathing heavy, flaccid paralysis, arm and leg. Knee jerk average activity left, absent right. Babinski present right. No clonus. Epigastric, abdominal and cremasteric reflexes active left, wanting right. Muscles right or left react perfectly to Faradic current. Twelve hours later, knee jerks present right but very slight. Thirty-six hours after, shock right knee jerk still more active. On the third day about the same. This patient died on the fifth day, the right knee jerk remaining throughout much less active than the left.

CASE 3. Child 19 months. Convulsions followed by right hemiplegia. Knee jerk practically wanting on paralyzed side, returned in two weeks.

CASE 4. Man, about 20. Embolus, rheumatism, endocarditis and pericarditis. Sudden attack 4 o'clock (embolus) loss of power right arm and leg, flaccidity, at 5:15. Knee jerk absent right, active left. At 7:30 more active right than left. Abdominal and epigastric still absent on right, lively on the left—cremaster and plantar slight on right and active on left. Recovery complete early the next morning, but before 11 he suddenly lost power again in right arm and leg. *The knee jerk was nearly wanting on right and Babinski was present.* Two days later the knee-jerk and cremaster were equal on the two sides, but the epigastric and abdominal had not yet returned on the right.

CASE 5. Man, 21, fell 11 feet, striking left parietal region. Right hemiplegia followed. Scalp wound without fracture. Forty-eight hours after injury the knee-jerk was present on both sides but much less active on the right. Plantar reflex of flexor variety alike on both sides. No clonus. Abdominal and epigastric present and alike on both sides. Cremaster present sluggish, both sides alike. Knee-jerk on the right increased daily and on the sixth day after the accident was the same as the left, both being at this time more lively than the left was originally.

CASE 6. Man, 35. Struck on head, automobile accident, 2 days ago, unconscious, delirious; left arm and leg paralyzed. Knee-jerk wanting both; Achilles present both but less left; cremasteric lively right, slow left.

In the following case there was bilateral paralysis with absence of reflex on both sides.

CASE 7. Woman, 57, fell down stairs, became unconscious with signs of fracture of base (immobile pupils and sunconjunctival ecchymosis). Seen 18 hours after accident: relaxed paralysis complete on left, nearly so on right. Absence of both knee-jerks and of plantar, abdominal and epigastric reflexes. No Babinski.

In the following case there was unilateral paralysis with lessening of superficial reflexes on the paralyzed side and absence of knee-jerk and Achilles on both sides.

CASE 8. Man, 33. Rheumatism, heart negative, marked atheroma at wrists and temples. Sudden left hemiplegia two months ago without unconsciousness. Arm, leg and face affected. Complete relaxation of left arm and leg to-day, but all movements possible. Knee-jerk and Achilles absent both: no Babinski; abdominal lively right, very slight left; epigastric lively right, practically wanting left; cremaster slight right, wanting left. The wrist reflexes were lively on both sides especially on the left.

In the following case the reflex was *lessened* in the part earliest and most completely paralyzed and *increased* in the other paralyzed parts.

CASE 9. Woman, 52, corpulent; probable hemorrhage, left hemiplegia, subacute onset, first arm, then leg; parts said to have been somewhat rigid from first. Seen 21 hours later. Unconscious practically but could be roused enough to answer simple questions; arm relaxed, leg moderately rigid. Wrist reflex present right, faint left; knee-jerk fairly active both sides, more active left (paralyzed side); Achilles slight right, active left; abdominal and epigastric present right, absent left.

In the following case certain reflexes were lost and others exaggerated on the paralyzed side. Those which were lost corresponded to the immediate site of brain injury.

CASE 10. Boy, 4 years, hit by automobile at 10 A. M. Depressed fracture over lower Rolandic region; trephined. Unconscious, restless with immobility of right arm, face and leg with flaccidity. Knee-jerk active left, faint right. Achilles normal left, exaggerated right and produces clonus. Babinski right. Patient died that night.

In the following case of incomplete paralysis the superficial reflexes were absent on the paralyzed side, the deep were exaggerated.

CASE 11. Woman of 60. Sudden hemiplegic attack 2 days ago, probably embolus; face, arm, and leg affected on left. To-day condition spastic, very little voluntary motion in arm or leg. Exaggerated knee-jerk especially left, clonus left, none right.

Babinski left, suggested right. No abdominal or epigastric left, abdominal only on right, slight.

In the following cases the knee-jerk was *exaggerated* on the paralyzed side.

Case 12. Woman, 40 years. Apoplectic shock with left hemiplegia; first examined 22 days later. Knee-jerk present right, fairly active left. No Babinski.

Case 13. Man 40. Hemiplegia left, attack 8 days ago. Knee-jerk active both sides, especially left.

We append the following cases of vertebral fracture.

Case 14. A man about 35 years was painting side of vessel when struck on neck by heavy plank; fell 30 feet. Was unconscious for a few minutes. Complete flaccid paralysis of arms and legs including deltoids. Complete anesthesia to second rib, including the arms. Complete absence of knee-jerk, Achilles, also epigastric, abdominal and cremasteric reflexes. No Babinski. All muscles react perfectly to Faradic current. Patient lived two days and a half during which time the condition of the reflexes and electrical reaction remained as at first examination.

Post-mortem examination showed crush of the cord at level of fifth cervical vertebra with rupture and hemorrhage.

Case 15. A man about 40, fell striking his head and bending his back. Complete loss of motion followed in the lower extremities with loss of knee-jerk, Achilles, abdominal, cremaster and plantar excepting that stroking the sole produced extensive and deliberate motion of the great toe downward and inward on **each foot** (modification of Babinski?) The epigastric reflex was present. There was anesthesia to the umbilicus. Operation (Dr. Mixter) revealed a fracture of the sixth dorsal vertebra.

We append also two cases of uremic coma.

Case 16. Woman, 50. Headache 6 days, restlessness and vomiting at frequent intervals, several days with temporary unconsciousness followed by thickening of speech. Urine high colored, contained albumin and casts; 27 oz. passed in 24 hours. One day complete anuria. Developed Korsakow's condition. On first examination by Dr. Walton there was flaccidity of the limbs with absence of knee-jerks on both sides. No Babinski. The pupils were small. There was cardiac enlargement, atheroma of arteries, and blood pressure of 150. Riva Rocci, 9 cm. cuff. Albuminuric retinitis. Three days later violent headache ensued with two attacks of brief unconsciousness with thickness of speech. Both knee-jerks still absent. Seven days after first examination complete left hemiplegia, rapid onset with relaxed paralysis. Knee-jerks still absent both sides. One month after first examination there was slight motion in fingers and toes. The knee-jerks had

returned on both sides, moderate on the right, more active on the left. No Babinski. Improvement continued, greater in the leg. The patient is now up and about.

Case 17. Female, 51. Three days before examination by Dr. Walton developed Korsakow's symptom and before 24 hours became unconscious. Urine contained albumin and casts, and 17 oz. were passed in 24 hours. All extremities flaccid but legs are drawn up on plantar stimulation. Absence of knee-jerk and Achilles both sides. Patient died two days later.

It seems a reasonable conclusion that lessening and loss of reflexes is the rule in apoplexy. It seems reasonable further to conclude that *complete* paralysis of cerebral origin is accompanied by absence of reflexes both superficial and deep, and that in the exceptional cases of apoplexy in which the reflexes are increased from the outset the withdrawal of cerebral influence has not been at any period complete.

The explanation that coincident disease of the spinal cord has abolished the reflexes is rendered improbable by the number of cases cited and the reappearance of the reflex. Under such a supposition we should have to assume the remarkable coincidence of cord disease limiting itself to the corresponding gray matter, and to assume also a recovery of reflex after such disease contrary to the usual experience.

It is necessary to explain the fact that in the case of cerebral hemiplegia, however complete, the reflexes almost invariably return and become active, while in the complete spinal lesion they do not.

It must be remembered, here, that in the complete spinal lesion both the crossed and uncrossed pyramidal fibers are destroyed, whereas in the case of hemiplegia the uncrossed fibers are still intact, thus furnishing a certain degree of the cerebral element which is requisite to the reflex.

We would also call attention to the not infrequent loss of reflexes in cerebral tumor. Out of 123 cases of tumor analyzed by the writers³, the knee-jerk was increased in 39, diminished or absent in 32, in 5 of which there was definite statement of hemiplegia with diminution of knee-jerk on the paralyzed side.

The absence of reflex not infrequently observed during an attack of epilepsy, in chorea, in idiocy, and in other forms of cerebral disorder, requires no elaborate explanation when the cerebral element in the production of the reflex is recognized.

³JOURNAL OF NERVOUS AND MENTAL DISEASE, August, 1905.

Such expressions as "irritative inhibition" may surely be dispensed with, as well as the assumption that the brain can exercise increased inhibitory influence at a time when it is deprived of such important functions as consciousness and voluntary motion.

It may well be that the complete scheme of the human reflex mechanism is far more complex than this outline would suggest, and that the reflex arcs at different levels of the brain may possess varying degrees of automatism and activity; this supposition would not be incompatible with the general principle we have formulated.

It is not impossible, for example with regard to the deep reflexes, that the arcs at the level of the red nucleus preside over a reflex less active than that of the lumbar cord, but more active than that of the cortex. In this event destruction of the paths between the cortex and the red nucleus would result in a reflex exaggerated over the normal but not identical with that produced by disease of lateral tracts of the cord.

Conclusions.

The deep reflex is a resultant of the activity of cerebral and spinal arcs, the longer arcs tending to produce a deliberate and moderate reflex, the shorter arcs an active and violent reflex.

The deep reflex varies in healthy individuals and in the neuro-psychoses according to the predominant influence of the longer or shorter arcs.

In disease of organic origin the partial withdrawal of the higher influence causes the spinal type of deep reflex, but the complete withdrawal of the higher influence causes abolition of the deep reflexes, since the spinal arc alone is incapable (in man) of sustaining the burden.

Upon re-establishment of the higher influence the reflexes return, the spinal type predominating if the re-establishment is partial, the normal type if it is complete.

Initial lessening or loss of deep reflex in the paralyzed parts is the rule in apoplexy. This condition persists for a period varying from half an hour to a number of days, after which these reflexes become normal or assume the spinal (exaggerated) type according as the return of cerebral influence has been complete or partial.

In the exceptional cases of apoplexy with initial exaggeration of deep reflexes the withdrawal of cerebral influence has been from the first incomplete.

The superficial reflexes, like the deep, have a cerebral control, and disappear on withdrawal of that control. The fact that they do not become exaggerated in disease of the pyramidal tract shows that they have little if any spinal representation.

The control of the Babinski reflex more nearly approximates that of the deep than that of the superficial reflexes.

A CASE OF LANDRY'S PARALYSIS WITH RECOVERY.*

By WHARTON SINKLER, M.D.,

OF PHILADELPHIA.

Since the description by Landry in 1859 of an acute ascending paralysis which, beginning in the lower extremities rapidly extends to the trunk and arms and later may involve the respiratory apparatus, thus bringing about death, a great number of cases have been observed both in this country and abroad. All writers are agreed that it is unusual for patients to recover from an attack. However, recently a number of cases of recovery have been recorded, and my excuse for reporting an isolated case is that although the paralysis was complete, involving the bulb and thus producing difficulty in deglutition and dyspnea, recovery took place rapidly and completely. I think that all who listen to this history will agree that the case was a genuine example of acute ascending paralysis, and from the absence of sensory symptoms, there being no history of alcoholism, diphtheria or other infection, will admit that the case could not have been one of multiple neuritis, nor could it have been myelitis, owing to the non-involvement of the bladder and rectum, absence of bed-sores, anesthesia and pain; neither could it have been a case of poliomyelitis anterior from the non-existence of muscular wasting or electrical changes.

There has been great confusion in the diagnosis of this disease and many cases of multiple neuritis have undoubtedly been reported as cases of Landry's paralysis with recovery. The diagnosis is not easy from certain aberrant forms of multiple neuritis, those cases, for example, in which there is rapid onset with only slight sensory symptoms, and there are undoubtedly cases of Landry's paralysis in which only the upper and lower extremities are affected and in which the respiratory organs are not involved. It is also difficult in some cases to make the diagnosis between an acute ascending poliomyelitis in an adult in contradistinction to Landry's paralysis, and there is no doubt that some of the cases which have been recorded in the past as spinal par-

*Read at the meeting of the American Neurological Association, June 4 and 5, 1906.

alysis in an adult were cases of Landry's paralysis. I reported one case myself many years ago as one of spinal paralysis of an adult, following Seguin's description, and feel convinced now, with a better understanding of the subject, that the case was one of Landry's paralysis. The patient made a complete recovery.

I shall not go in detail into the pathology of the disease, as this seems to be still uncertain. The lesions which have been found have been various and there have been no recent observations throwing any additional light on the morbid anatomy. It is certain that many reliable observers have found changes in the spinal cord, indicating vascular and perivascular inflammatory conditions suggestive of the early stages of acute myelitis. Other authors, Bramwell for example, remark that in the majority of cases post-mortem results are entirely negative.

In the case of acute ascending paralysis reported by me in 1891, Dr. Charles W. Burr made a careful examination of the cord and described various changes in the vessels and cells, characteristic of acute myelitis involving the upper part of the cervical cord. Hun and others have also recorded cases of Landry's paralysis in which at post-mortem the cord showed changes similar to those in acute myelitis.

There is one point, however, upon which all recent observers are agreed, and that is that the disease is due to an infection, although no one has pointed out just what the microorganism is. The history and course of every case is suggestive of a definite infection. Although the temperature does not rise to any great extent, nevertheless there is always some febrile reaction, and there is often muscular soreness and general discomfort similar to what is seen in an attack of grippe or other acute infection.

Gordinier, in the *Albany Medical Journal*, 1904, remarks: "I believe, therefore, with Diller that the term Landry's paralysis cannot be dropped, not only because of its long usage, but because by its use we include a group of cases which stand midway between poliomyelitis and multiple neuritis, which cases show definite but slight changes by our newer methods of research confined to the most part to the ventral motor neurones and doubtless due to the circulation in the blood of microbic or metabolic toxins."

The most recent writers, among whom are Knapp, Mills and Spiller hold the view that Landry's paralysis is an "acute paren-

chymatous degeneration of the peripheral motor neurones of toxic or infectious origin."

Buzzard, *Brain*, 1903, p. 94, in a valuable contribution to the pathology of Landry's paralysis, refers to 25 cases in which bacteria were looked for and not found, either by cultivation or by staining tissues, or by both methods. He points out, however, that changes similar to those met with in the nervous system have been caused experimentally by numerous investigators to be produced by microbic toxins in the absence of microbes themselves. He found 13 cases of Landry's paralysis in which organisms had been demonstrated; and in four of these a diplococcus was present. In a case reported by him he found a micrococcus which stained with Loeffler's methylene blue, in the soft vascular tissue which lies external to the dura mater. In broth inoculations from heart blood, he obtained a culture of a micrococcus indistinguishable from that found in the external part of the dura. The subdural injection of a cultivation of this organism into a rabbit was followed by a rapidly spreading palsy.

Mettler, in the *Journal of the American Medical Asso.*, Vol. 42, p. 1267, quoting Buzzard, Taylor and Clark, concludes that "The pathological changes in Landry's paralysis may be divided into four classes.

"1. Changes in peripheral nerves, indicative of interstitial and parenchymatous neuritis.

"2. Evidence of disease only in spinal nerve roots, and according to Buzzard, the changes are more common in the anterior roots.

"3. Spinal cord involvement, that is, disseminated foci of inflammation, exudates and capillary hemorrhages into the medulla and cord, a swelling of the axis cylinders of the anterolateral tracts and poliomyelitic lesions.

"4. Changes in which all parts of the lower motor neurones, including peripheral nerves, spinal roots and ganglion cells are involved in a scattered and diffuse pathological process."

Rolby reports 7 cases which have been seen in the Medical Clinic at Leipsig in 15 years, and concludes that Landry's paralysis is not a clinical entity but a symptom complex occurring in certain cases of acute polyneuritis, and that cord changes when they occur are due to an ascending neuritis reaching the cord.

It is obvious from the above quotations and numerous others

which could be made, that there are still considerable differences of opinion in regard to the nature and pathology of Landry's paralysis, and it is therefore important that all the light possible shall be thrown upon the disease, not only by the report of pathological findings, but also by the recording of cases.

The following patient was seen by me in consultation with Dr. Edward G. Rhoads, who has kindly permitted me to report it:—

S. W. J. Male. Aged 30 years; single. Seen with Dr. Rhoads, May 2, 1904. He has always been temperate as to stimulants and has been a total abstainer for a year. He has smoked moderately. He is employed as a draughtsman in a large machine shop and his hours of work are from 8 A. M. until 5.30 P. M. He has taken much outdoor exercise, has ridden much on horseback and has followed the hounds to a considerable extent. Recently he has been running an automobile every Sunday. He has enjoyed excellent health in every respect and has had no sore throat or any acute disease. On April 24th he ran his automobile about 40 miles. He was not unusually tired nor did he feel chilled when he returned home. The following morning he got up as usual and went to his work, but by evening he felt tired and went to sleep soon after dinner. By bedtime he felt a general stiffness and a slight sense of prickling in his fingers. The day following on rising he felt more stiff, but went to his work, and in the evening went out to dine. He found that he was rather stiff in walking and especially so in going up stairs, and that it was impossible for him to walk very fast. On Wednesday, the third day after the beginning of his symptoms, he went to work as usual and worked all day, but by evening he was still more tired and stiff. On the fourth day he again went to work and found that there was great difficulty in walking. He tried to run to catch a street car and found that it was impossible to do so. By noon of this day he was obliged to give up work and went home. The day following, that is, the fifth day, he sent for Dr. Rhoads. He found that his temperature was normal, and that he was suffering some pain in the calves of his legs. There was no tenderness in the nerve trunks but there was great weakness in both legs and arms. He walked with some difficulty and the grip of his hands was very weak. On Sunday, the seventh day, he was worse in every respect. He fell down while attempting to walk to his bath room and had some difficulty in rising. When seen by me on the following day, I found a well nourished man with good color and healthy appearance. He was sitting in a chair but was unable to rise to his feet without assistance. With one person on either side of him he was raised to his feet and with much support was able to walk across the room. His arms are

weak and the grip feeble, but he can perform every movement in a feeble manner. He is unable to cross his legs but can perform other movements feebly. There has been no bladder or rectal weakness; no backache and no girdle pain. He feels tired in his neck when sitting up, but it is not painful. There is a sense of numbness and tenderness in the feet, and his hands feel as if asleep as far as the wrists, but the tactile and pain senses are absolutely preserved and there is no loss of power of localization and no astereognosis. There is complete loss of plantar reflex, knee jerks, Achilles reflex, cremasteric, abdominal and all reflexes in the upper extremities. The only reflex that can be excited is the epigastric. Pupillary reflexes are normal as are all of the facial movements, including movement of the tongue. There is no tenderness on pressure. It was advised that the patient be kept in bed, and aspirin was prescribed.

May 6th. Patient complains of stiffness and numbness in the legs, especially at night. The loss of power has increased materially. He cannot flex his legs, but he can extend them feebly. He can flex and extend the feet and toes but the movement is very weak. These are the only movements in the legs. The grip of the hands is much weaker and he has practically no power to move either arm. There is no change in sensation except that now astereognosis is present. He is unable to determine what is the nature of any object placed in his hand. There is now marked weakness of the facial muscles. He is unable to smile or to make any movements of the mouth, and his face is like a mask. He is unable to raise the upper lip to show the teeth. Protrudes his tongue and closes the eyes well. He has no difficulty in deglutition.

May 8th: Loss of power in the face is greater and now there is only slight movement on left side. In smiling, the left side of the face moves a little, and while he is able to close both eyes the orbicularis is very weak. He is unable to raise the brows. He cannot swallow solids or semi-solids, but can take without difficulty rice which is covered with cream or milk and toast which is very moist. This seems to slip down without causing any trouble. He is sleeping badly. There is more loss of power in his legs and the only movement which he has is a slight power to extend the right leg after it has been flexed and very slight movement of flexion and extension of the feet. This is almost imperceptible. There is no loss of power over the bladder or rectum but he does not know when he has finished urinating, and the bowels are inclined to constipation. The temperature has varied from 98.4-5 to 101 degrees. The pulse is about 80 and respiration 20.

May 10th: Patient is somewhat better as regards the facial movements. Inability to move his lips is not so complete, and the left orbicularis palpebrarum closes a little more strongly. He

is still unable to pucker his mouth or to masticate properly. An electrical examination was made on May 9th and showed no change in any of the muscles to the faradic current: all respond promptly and freely. He was very much exhausted after the examination which lasted more than half an hour and this morning he has felt weaker than at any time. The aspirin was now discontinued and bichloride of mercury—1-12 gr. three times a day and strychnia 1-30 gr. four times a day—were ordered.

May 16: Patient has improved in facial movements and the left arm is a little stronger. He is now able to put the hand on top of the head, while three days ago he could not get it as high as his face. The right arm is weaker than the left and the grip weaker. He has less trouble in deglutition, but yesterday was a good deal annoyed by an accumulation of mucus in the mouth, and he is still unable to swallow solids. His appetite is fairly good. Sensation in the feet is not quite as acute as it was, but it is preserved. Bladder and rectum are about the same. From this time on, the patient gradually improved, the power returning first to the arms and later to the legs. By June 1st he was able to sit up and by the end of the month he walked about his room. July 1st he went out to drive and by the latter part of the month he went to the coast of Maine, where he remained the balance of the summer.

He was examined by me again on October 1st, 1904, and was at that time perfectly well and was riding horseback, jumping his horse and following the hounds. About Thanksgiving, 1904, he was taken down with typhoid fever. He did not have a serious attack and his convalescence was about normal. He experienced no more difficulty in walking during this time than anyone else would have. During the third week of the typhoid he had an ischio-rectal abscess which was opened and healed promptly. When seen by me two months later he seemed in perfect health, and weighed 150 pounds. The sensation was normal in feet and hands. Dyn. R. 190 and L. 160 K. JS. were still absent, also the Achilles jerk, but the plantar reflex was present feebly.

I had the opportunity of examining the patient again in the latter part of May, 1906. He was in vigorous health and the knee-jerks were readily obtained. With re-enforcement they were quite active.

LIMITED AREA OF ANESTHESIA, EPILEPTIFORM ATTACKS
OF HEMIALGESIA, AND EARLY MUSCULAR ATROPHY
IN A CASE OF BRAIN TUMOR.¹

BY MORTON PRINCE, M.D.,

OF BOSTON.

PROFESSOR OF DISEASES OF THE NERVOUS SYSTEM, TUFTS COLLEGE MEDICAL
SCHOOL.

OPERATION BY JOHN C. MUNRO, M.D., SURGEON-IN-CHIEF TO THE CARNEY
HOSPITAL, BOSTON.

The following case is reported because showing as result of a cerebral lesion: (1) circumscribed limited area of anesthesia; (2) marked muscular atrophy, appearing early; (3) epileptiform attacks of hemialgesia of a peculiar nature; (4) loss of the muscular sense, astereognosis, ataxia, and paresis, increasing to ultimate paralysis.

Mary S., age 19, appeared at the Neurological Department of the Boston City Hospital in November, 1902. She reported that she had been perfectly well until within about a year, when she had had some pain in the right shoulder which had promptly yielded to treatment. Six months later this pain in the shoulder returned, and she had suffered from recurring attacks of it since that time. On questioning her it became apparent that the attacks were of a somewhat peculiar character: beginning in a definite region of the body and well defined, the pain spread to successive segments of one side of the body until the whole right side became involved, much as in epilepsy the spasms may extend to adjoining muscular groups. The attacks, which always affected the same side, lasted about half an hour. I had an opportunity to observe some of these attacks. The pain began in the fingers of the right hand, extended up the arm and around the shoulder to the back of the neck, and then involved the right side of the face, the inside of the mouth, the tongue, and the eye of the same side. Having reached this stage, the pain began at once to extend down the back and the right leg, eventuating in a right hemialgesia. The patient stated that these attacks had lately come on every week or two, and that in some of them she had lost consciousness. There was a history also—confirmed by her physician—of attacks of clonic spasm in the right arm, accompanying the pain.

¹Read in abstract at the meeting of the American Neurological Association, June 4 and 5, 1906.

In one or two of the attacks of pain which I had the opportunity of observing, there was evidently some disturbance of consciousness, the patient being unable to answer questions, but consciousness was not absolutely lost. Clearly, the attacks were of an epileptiform character.

During much of the time there had been a good deal of headache and dizziness, especially with the attacks of pain. Nausea also had accompanied the attacks, but had not been present at other times. There had been no vomiting. In May preceding her first appearance at the hospital, that is at the time these attacks became recurrent, her physician called her attention to the fact that there was wasting of the shoulder muscles of the right arm. Since that time the arm has been steadily growing weaker.

Examination. Considerable general weakness in the right upper extremity: she could scarcely hold her arm out straight, but she had good control of all the muscles, including those of the hand. There was marked wasting of all the arm muscles, evident also in the small muscles of the hand: the deltoid and possibly the outer head of the triceps were most prominently affected. The atrophy was out of proportion to the paresis and sufficient to suggest spinal origin, but the electrical reactions of the affected muscles were perfectly normal. Mechanical irritability was increased in the muscles of the right arm, but no fibrillary twitching was observed.

The deep reflexes of the right arm were somewhat exaggerated and greater than those of the left. The knee-jerk was increased on the right but not on the left. There was no ankle clonus and no Babinski. Corresponding to the increased knee-jerk, the patient complained that the right leg felt weaker than the left.

Tactile sensation was slightly diminished over a circumscribed area, which included the right shoulder, the right side of the neck, and the right side of the face. The thermal sense was normal, and the pain sense was not diminished out of proportion to the tactile sense. Thus it will be seen that there was no sensory dissociation, such as is characteristic of syringomyelia.

Examination of the eyes showed the presence of optic neuritis. A diagnosis was made at this time of cerebral tumor.

Shortly afterward the patient left the hospital, against advice, and was not seen again for three months, when (February 20, 1903) I visited her at her home. Her condition had changed very markedly for the worse. She was absolutely blind, and was unable to walk on account of paralysis of the right leg. The weakness of the right arm was much increased, so that she could not move the fingers at all and could scarcely raise the arm at the shoulder. There was slight flexion and extension at the elbow. The paralysis was of flaccid type. Atrophy of the hand

and arm was more marked and fairly symmetrical. The condition of sensation was very interesting. Loss of tactile sense was slight and about the same in intensity as at the first examination, but it had extended over the whole right arm. She could feel a very slight touch of the examining finger, but not so well as on the left. Pain sense, tested with a pin, was normal, but the muscular sense of the fingers was so much impaired as to be nearly lost; she could not tell with any certainty the position of her fingers, whether flexed or extended. Heat and cold she recognized. In contrast with the slight loss of tactile sense and corresponding with the great loss of the muscular sense, there was complete astereognosis. The patient could not recognize any object put into her hand, even when her fingers were pressed down upon it. (Sensation over the remainder of her body was not tested at this time.) In regard to her previous symptoms, she stated that since the blindness had come on, the headache and epileptiform attacks had ceased; also, that she had had much nausea but little or no vomiting.

On March 6, about a fortnight later, she was again examined and her condition found to have grown progressively worse. The whole right upper extremity was absolutely paralyzed. The lower extremity was paretic, but she could move it about the bed. There was a slight weakness of the right side of the face. There was some contracture of the bicipital group, and the fingers were flexed into the palm by a similar contracture; the fingers and arm could, however, be partially extended. There was also slight resistance to passive motion of the right leg as compared with the left (i. e., slight spasticity). On account of mental dulness it was not possible to determine sensation with accuracy. A sharp pin prick could be distinctly felt over the right arm, leg and face. It was not possible to determine astereognosis at this time. Examination for the Babinski sign showed that it could be brought out on both sides, on the right somewhat more markedly. There was no ankle clonus. The right knee jerk was distinctly increased and greater than the left, which was also slightly plus. The deep reflexes of the right arm were slightly greater than the left, but were not excessive. The whole right arm was smaller than the left. Marked atrophy was present in all the muscles. There was very little difference in the lower extremities. With faradism there was no perceptible difference between the reactions of the small muscles of the right hand and those of the muscles of the left, or between the reaction of the right and left deltoid muscles. The same was true also of the galvanic reactions of the same muscles; no polar or other change of R. D.

The diagnosis was that of cerebral tumor, located primarily in the cortical arm area, probably centralized in the post-central convolution, and from there extending backwards into the pari-

etal region and forward into the anterior central convolution. In the hope of relief, an operation was recommended. She was removed to a private hospital and placed under the care of Dr. John C. Munro and operated upon.

The location of the tumor was placed primarily posterior to the fissure of Rolando, on the basis of Sherrington and Grünbaum's experiments (at the time relatively recent). In deference to Mills's views on astereognosis, it was thought that the growth probably had extended backwards into, or exerted pressure backwards upon the parietal region. The secondary developing paralysis, it was thought, could be accounted for by extension or pressure forward into the precentral gyrus. A diagram which I have here and will exhibit, of this probable location, involving chiefly the postcentral convolution, was made just previous to the operation. On removal of the bone flap, the actual site of the tumor, as far as one could tell, corresponded with this diagrammatic localization. The tumor was removed, but, as there was no autopsy, it is impossible to define the exact limits within which the brain was invaded or destroyed. Previous to the operation, the Rolandic fissure was carefully mapped out by two methods, and the bone flap (see report by Dr. Munro) was so made that this fissure traversed it as a central line. The tumor was found about the middle of the opening, and must have involved both of the central convolutions. It was a soft, friable mass, which was found by the pathologist, Dr. Joseph H. Pratt, to measure about 6 cms. in diameter and from 1 to $2\frac{1}{2}$ cms. in thickness. There was no evidence that it had extended far into the parietal lobe, but, owing to the absence of autopsy, the difficulty in determining the exact size of such a friable tumor, its exact location, or the extent of the brain damage, I do not think the case can be cited as evidence of localization of function; though it is neither better nor worse than many cases that have been offered for that purpose. All that can be said is that the findings, taken in connection with the history of the case, are compatible with the theory that the postcentral convolution is sensory, including both the tactile and muscular senses, and possibly stereognosis.

The interesting points are: The original limitation of the (tactile) anesthesia to the neck and side of the head, conforming to the view that there is a focal localization of sensation in the cortex, as with movements: the slight degree of its intensity; the peculiar attacks of pain, spreading by segments; and the muscular atrophy. The last, in the beginning, was out of proportion to the paralysis.*

*For a digest of the literature on atrophy in cerebral disease see article by Dr. Theodore H. Weisenburg, "A Clinical Study of Hemiplegia in the Adult," *Journal of the American Medical Association*, February 25, 1905.

REPORT OF OPERATION BY DR. J. C. MUNRO

On March 10th an osteoplastic operation was performed. An omega-shaped flap (about $2\frac{1}{2}$ in. by 2 in.) was made over the left motor area with its center over the fissure of Rolando and its upper margin about $\frac{1}{2}$ in. from the sagittal suture.

As the flap was turned down it was noticed that the bony plate was eroded probably by pressure from within. The dura was tense, and at the upper medial portion so thin that it was torn by the jaws of the forceps or else had become eroded.

The condition of the patient by this time was so bad that the operation was stopped and the flap replaced and sutured, allowing for a rubber tissue drain.

The patient rallied fairly well in a day or two, and on March 17 the operation was continued.

The bone flap was turned back, and then the dura, when a translucent, pale yellow gelatinous material bulged forth. With the finger a mass of new growth, gliomatous in appearance could be shelled out from the brain, which apparently was pushed away from the dura by the growth. The latter, in places, was apparently incorporated within the brain itself, and some of the growth at this operation was probably left behind. Sharp hemorrhage from the edge of the dura and pia and less from the brain substance itself was controlled by forceps and gauze pressure. The pulse became very weak and rapid (180) and patient was in bad condition.

Venous injection of salt-solution gave some improvement. Gauze packing was pressed between the brain and bone flap and patient put to bed. Under moderate stimulants, she improved considerably, although the pulse continued at 120 and the temperature about normal.

On March 23rd a large hernia had developed, pushing up the flap like a lid and bulging outwards. There was steady leakage of fluid and pus from two stitch holes of the first operation, and about the edge of the flap.

The flap was turned back again and a lot of soft brain removed nearly to the level of the skull. So far as could be told, all the remaining growth and a good deal of infected and healthy brain tissue was removed. There was good pulsation and no evidence of intracerebral pressure.

There was no shock from this operation, and for a day or two she did fairly well. On the 26th her temperature and pulse started to rise, and she failed rapidly, dying on March 28th.

It is unfortunate that the wound infection at or after the second operation could not have been avoided. The enforced delay of a week on account of the bad general condition, the ingrowth of hair with its accompanying seborrhea bathed in cerebrospinal fluid, together with a hurried cleansing at the second

operation, all tended to some infection that in a patient of ordinary physical vigor would not have given trouble.

"Specimen consists of soft, opaque, white tissue forming a mass about 6 cm. in diameter. The overlying pia mater is smooth and normal in appearance aside from injection. The surface is nodular. The thickness of the mass is 1 to 2½ cm. on section no gray matter discernible. It is infiltrated with areas of hemorrhage. When hardened in formalin, the tissue is semiopaque and granular on section.

"Microscop. section: The tumor is composed of closely packed cells with round and vesicular nuclei, the cell outlines are not visible. It is very vascular. The cells have a perivascular arrangement and appear to form the outer portion of the vessel's wall. No neuroglia fibers can be demonstrated. Diagnosis: Endothelioma originating probably from the pia mater."

SEXUAL INFANTILISM WITH OPTIC ATROPHY IN CASES OF TUMOR AFFECTING THE HYPOPHYSIS CEREBRI.*

BY HARVEY CUSHING, M. D.,

OF BALTIMORE.

ASSOCIATE PROFESSOR OF SURGERY IN THE JOHNS HOPKINS UNIVERSITY.

A disturbance of menstrual function may be one of the earliest symptoms of a certain class of intracranial tumors. Particular attention has recently been called to this fact by Axenfeld and Yamaguchi, by von Abelsdorf and by Müller. Growths in most diverse situations, or, indeed, an increase of intracranial tension from conditions non-neoplastic, have been known to affect the regularity, or even to completely interrupt for long periods, previously normal catamenia. In the personal records of about sixty cases of brain tumor, the majority of which have come under my care in Dr. Halsted's service during the past five years, a history of menstrual disturbance has been recorded in several instances. The physiological explanation of this symptom can only be conjectured, but it seems quite possible that in some way it is due to an interference with the normal activity of the pituitary gland.

The cases may be divided into two groups: One, those in which amenorrhea accompanies tumors arising from the hypophysis or affecting the gland by direct compression; the other, those in which menstrual disturbance is a symptom of tumors situated elsewhere. In the latter group Müller has suggested that an internal hydrocephalus, through distension of the recessus infundibuli, may interfere with the function of the gland. There is, however, no certain proof of this. In the former group—those with tumors in the hypophyseal region—the relation of sexual development and menstrual activity to the condition of the pituitary gland is more clear. I shall limit myself to the consideration of lesions of this type; and inasmuch as the two patients, whose histories I shall report have been women, I shall not consider the effect of similar lesions on the male, although in

*Read at the meeting of the American Neurological Association, June 4 and 5, 1906.

this sex, as well, instances of hypoplasia of the genital organs associated with hypophyseal tumors have been recorded.¹

Axenfeld,² in 1903, pointed out that basal tumors involving the hypophysis are those which most commonly produce amenorrhea and optic atrophy, and he drew a comparison between this symptom-complex and acromegaly, a disease often associated with an hypophyseal enlargement or tumor and accompanied by amenorrhea. His cases were subsequently reported in full by Yamaguchi.³ One of them, a patient who had never menstruated, was sexually undeveloped, and the optic atrophy, which was present in this as well as in the other patients, was a simple ascending atrophy not consequent upon a choked disc. He suggested that the closure of the nerve sheath prevented the formation of a "papillitis," but as will be seen in the first of my cases, a choked disc may develop in a nerve already partially atrophied as the result of direct pressure.

In the same year Abelsdorff,⁴ in a note concerning Yamaguchi's paper, called attention to a previously recorded case of benign growth of the base, presumably an enchondroma, in which amenorrhea preceded all other symptoms for ten years. Subsequently disturbances on the part of the optic nerves appeared.

Again Müller,⁵ in a recent article, has collected five cases from the Breslau clinic, one of which (Case 4) seems to me to have possibly belonged to this group. A patient, 29 years of age, had been a slowly developing, weak child. She had had some slight, irregular menstruation first at 21 years of age, but after a few months the scanty flow ceased to reappear. Not until she was 22 had her breasts enlarged, and she was otherwise developmentally backward. There had been a gradual loss of vision. In addition to these symptoms, there had been frontal headaches, vomiting, and occasional brief lapses in conscious-

¹Fröhlich: "Ein Fall von Tumor der Hypophysis Cerebri ohne Akromegalie." Wiener klinische Rundschau, 1901, Nr. 47 and 48. Contains a review of the literature.

²"Sehnervenatrophie und Menstruationsstörungen bei basalen Tumoren." Neurolog. Centralblatt, 1903, p. 608, Sitzungsbericht.

³"Ein Beitrag zur Pathologie des Sehnerven bei Hirnerkrankungen." Klin. Monatsbl. f. Augenheilk., 1903, Festschrift für Manz. Beilageheft zum, xli., p. 180. Ref. Jahresbericht des Neurol. u. Psychiat., 1904.

⁴Abelsdorff, G.: "Offene Correspondenz." Klin. Monatsbl. f. Augenheilk., Vol. xli., 1903.

⁵Müller: "Ueber die Beeinflussung der Menstruation durch cerebrale Herderkrankung." Neurolog. Centralbl., 1905, No. 17, p. 790.

ness. It is noteworthy that here there were no so-called localizing symptoms; the writer, however, regarded the case as one of probable tumor.

In consultation with Dr. A. P. Herring, I have seen a patient with symptoms very similar to those thus described by Müller. A young woman, of 21, has suffered for years with headaches. She has been blind since she was 16. There is double optic atrophy with no edema of disc or retina. She has never menstruated. The pelvic organs and breasts are undeveloped. Her intelligence, considering that she has received no education, seems normal. She has become spastic, and her extremities are wasted and contracted.

Some light is shed on the seat and nature of the lesion from which these patients were suffering by the case which I may now report more fully:

CASE 1. Mary D., a seamstress, 16 years of age, was admitted to Dr. Osler's wards in the Johns Hopkins Hospital Dec. 12, 1901, complaining of pain in the back, dizziness and headache. Little could be learned of her family history. She has two elder sisters, who are healthy.

She has led an unhygienic life; has worked for some years as a seamstress (shirt maker) for eleven hours a day, walking several miles to and from her place of employment. She has suffered from headaches for years. She has never menstruated; never "developed."

A month before her admission her headaches became worse; she began to have pain in her eyes, and dark spots obscured her vision. She has also suffered with pain "over her kidneys," chilly sensations, fever and sweats. She has been drowsy. There has been anorexia, with nausea and vomiting on taking food. Her bowels have been constipated. She says her legs have been swollen for a week, and she cannot stand or walk.

For two months after her admission the patient was kept under close observation and made the object of special study. She was much undersized, looking like a child of twelve. She seemed well nourished; mucous membranes of a good color. Her skin was smooth, almost waxy in appearance. Her hands and feet were small like a child's; she had short, unusually tapering fingers. Her tongue was heavily coated, her breath foul, her gums soft and spongy.

Examination of her chest and abdomen was negative. Her breasts were undeveloped. There was a scant growth of axillary and pubic hair. There was no certain edema of the extremities, though the smooth, waxy skin over the abundant panniculus

made it seem that "pitting" would be possible, and one observer records "very slight edema of feet and hands." There was no cranial nerve involvement; ophthalmoscopic examination was negative; vision was normal. Beyond a constant slight leucocytosis, elaborate examinations of the blood revealed nothing abnormal; there were no arthritic symptoms; no purpuric spots. The urine, likewise, on repeated examinations, except for an occasional hyaline cast, proved negative.

Reading between the lines of the history, it is evident that until Feb. 12th, when a definite choked disc was found, the diagnosis of the patient's condition had been very obscure, and that renal disease or some unusual form of malnutrition, perhaps associated with scurvy, was suspected.

Though the eye grounds had been examined on several occasions, the first mention (other than that there was "a suspicious blurring of the nasal half of the discs," Dec. 24th) of a definite change occurs under the date of Feb. 12th, when a double optic neuritis ("neuro-retinitis") is noted. It is apparent from the history that this finding only sufficed to further obscure the diagnosis.*

From this time on the patient's condition became progressively worse. She had frequent attacks of severe headache with projectile vomiting. She was in a more or less stuporous condition much of the time, but would often sit up in bed suddenly and cry out with pain. She constantly complained of pain in her eyes and of failing vision. The swelling of the discs increased rapidly, especially on the left, where some retinal hemorrhages were found on Feb. 15. The deep reflexes at knee and ankle were active, but there was no clonus. Plantar reflexes were normal. She once had incontinence of urine during a period of bad headache.

On Feb. 16th her vision had so far failed that she was barely able to count fingers. Vision 20-40. Perimetric fields difficult to chart owing to dull mental condition. They show little more than a general shrinkage (Fig. 1). No bitemporal hemianopsia.

On Feb. 17th a lumbar puncture was performed, and 20 cc. of clear fluid under increased tension (maximum 51 cm., minimum 39 cm.) were withdrawn. This only served to increase her headache.

On Feb. 18th the patient was seen by Dr. H. M. Thomas, who considered the headaches more characteristic of intracranial growth than of nephritis. No localizing symptoms could be made out.

*It is merely another instance of the difficulty of distinguishing between the so-called albuminuric retinitis and choked disc. I have commented upon this elsewhere (*Surgery, Gynecology and Obstetrics*, October, 1905), and some experimental observations (with Dr. Bordley and Dr. Gilman) have led us to believe that the process is the same in tumor and nephritis.

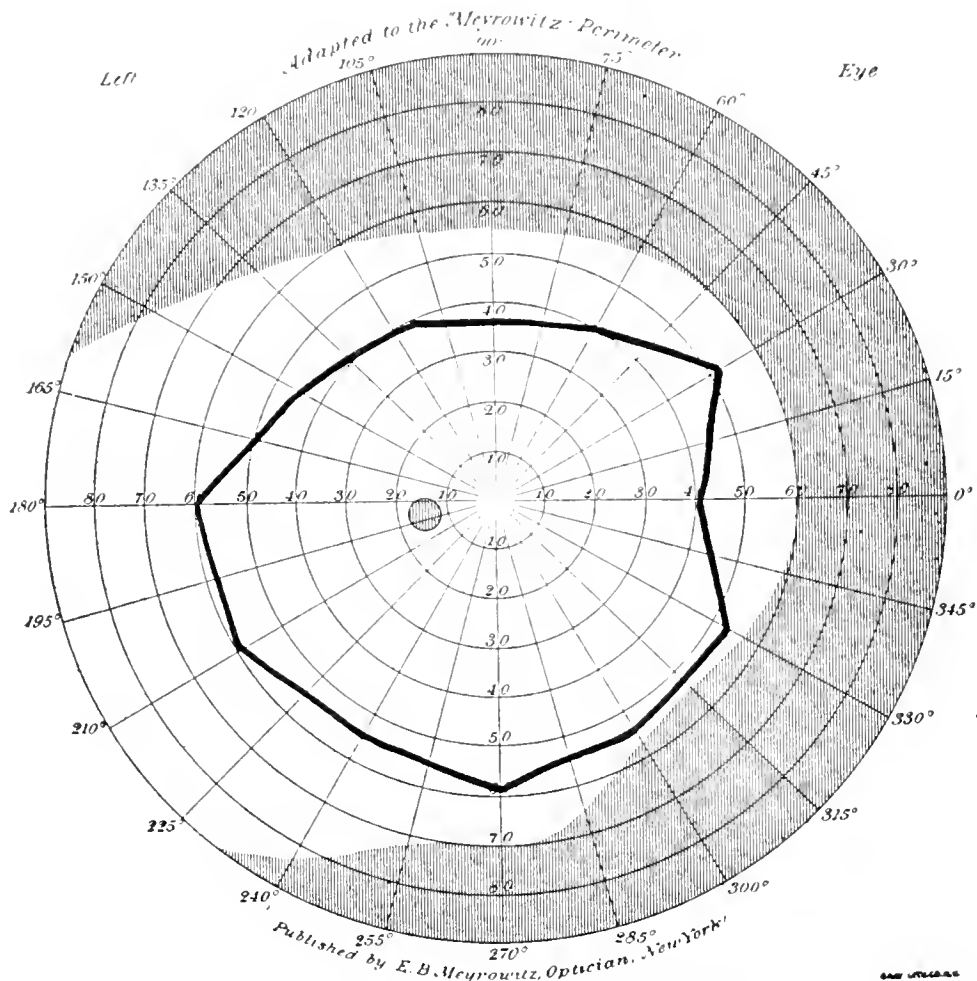
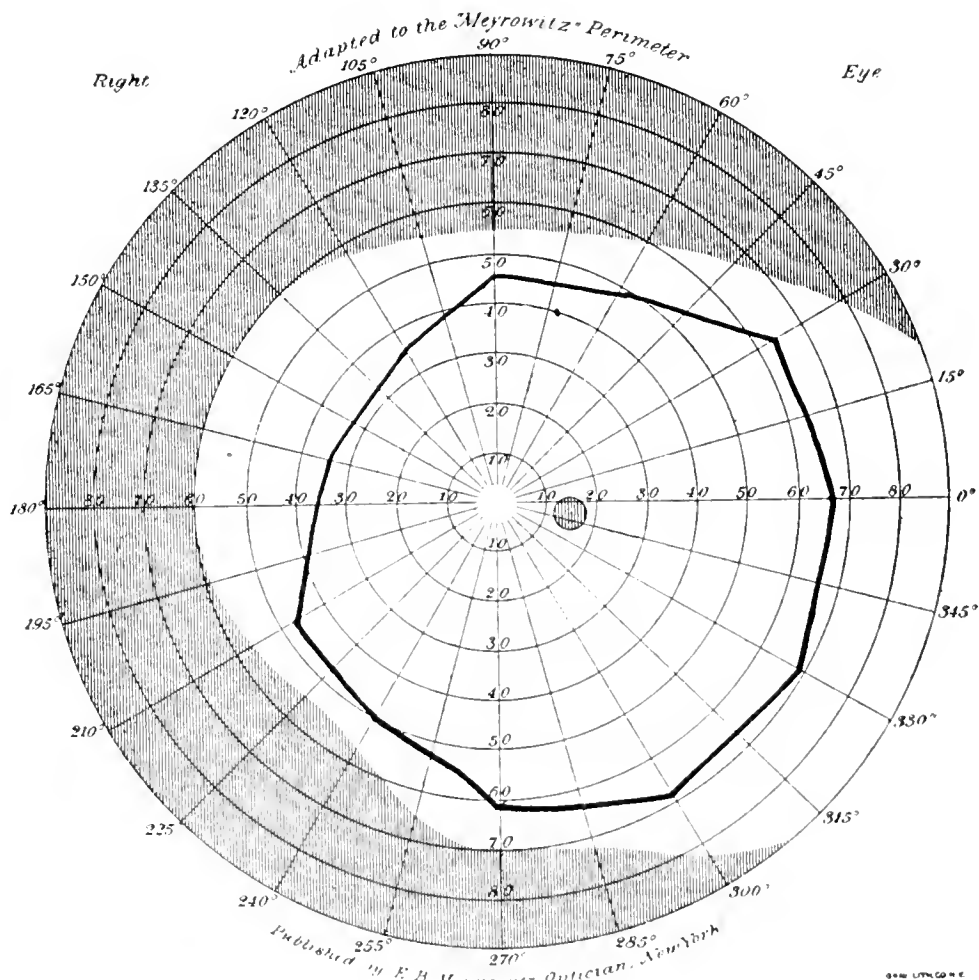


FIG. I. FORM FIELDS OF CASE I, SHOWING MERELY CONCENTRIC SHRINKAGE.

On Dr. Thomas's advice she was transferred to the surgical side for an exploratory operation. Little was understood at this time of palliative operations, and looking back upon the case it is difficult to see what we could have expected to gain by surgical measures.

Operations: On Feb. 21st an exploratory craniotomy was performed. A bone flap was turned back from the left hemisphere; the dura was opened; a tense bulging brain was disclosed, which made subsequent reclosure of the dura impossible;⁷ the layer of bone was removed and the scalp resutured in place. The operation sufficed to completely relieve the patient's headaches, but it left her with some contralateral palsies, which we to-day understand to have been the result of the protrusion of cortex through the dural opening, this having been so made as to include much of the motor cortex. The wound healed without reaction.

On March 8th a second exploration was made over the right hemisphere. The same condition of affairs was found, and again the bony shell of the flap was removed, the dura left open and the scalp wound closed. The ventricle was not aspirated on this or the previous occasion. The wound healed per primam.

Following the operation, the patient improved greatly. The paralysis, which had resulted from the hernia through the opening made at the first operation, disappeared, and by the third day the edema had almost completely faded from the disc and retina of each eye. The hernial protrusions, furthermore, were very slight and gave evidence of little tension. She was free from pain, had no vomiting and was subjectively well and happy.

Not satisfied with this result, we were led, through the development of some ataxic symptoms, into what proved to be a meddlesome and disastrous operation.

On March 17th a third operation was done, and the cerebellum was exposed. The exploration proved negative, and the wound healed perfectly, but the patient soon after grew dull and stuporous, the hernial protrusions again became tense, marked spasticity of all the limbs, with great exaggeration of the reflexes,

⁷I have only recently learned how it may be possible in these cases to resuture the dura when it is desired to do so. I have on three occasions been able, after a lumbar puncture and removal of the ventricular fluid, to close the dura over the hemisphere, which before the puncture bulged to such an extent that closure could not have been effected without injury to the brain, if at all. It would have been a suitable procedure in this case considering the internal hydrocephalus, and had it been done the dura might have been closed and the subsequent hernia avoided. In purely palliative operations, however, it is desirable, indeed essential, that the dura be left open and the overlying bone removed, as has been learned from later experiences (cf., "The Establishment of Cerebral Hernia as a Decompressive Measure for Inaccessible Brain Tumors," *Surgery, Gynecology and Obstetrics*, October, 1905).

set in, and she remained in an unconscious condition until six weeks later, when death occurred from inanition and inhalation pneumonia. It is probable that, as a result of the suboccipital operation, with consequent cerebellar protrusion, some dislocation of the tumor had taken place which led to an obstruction of the

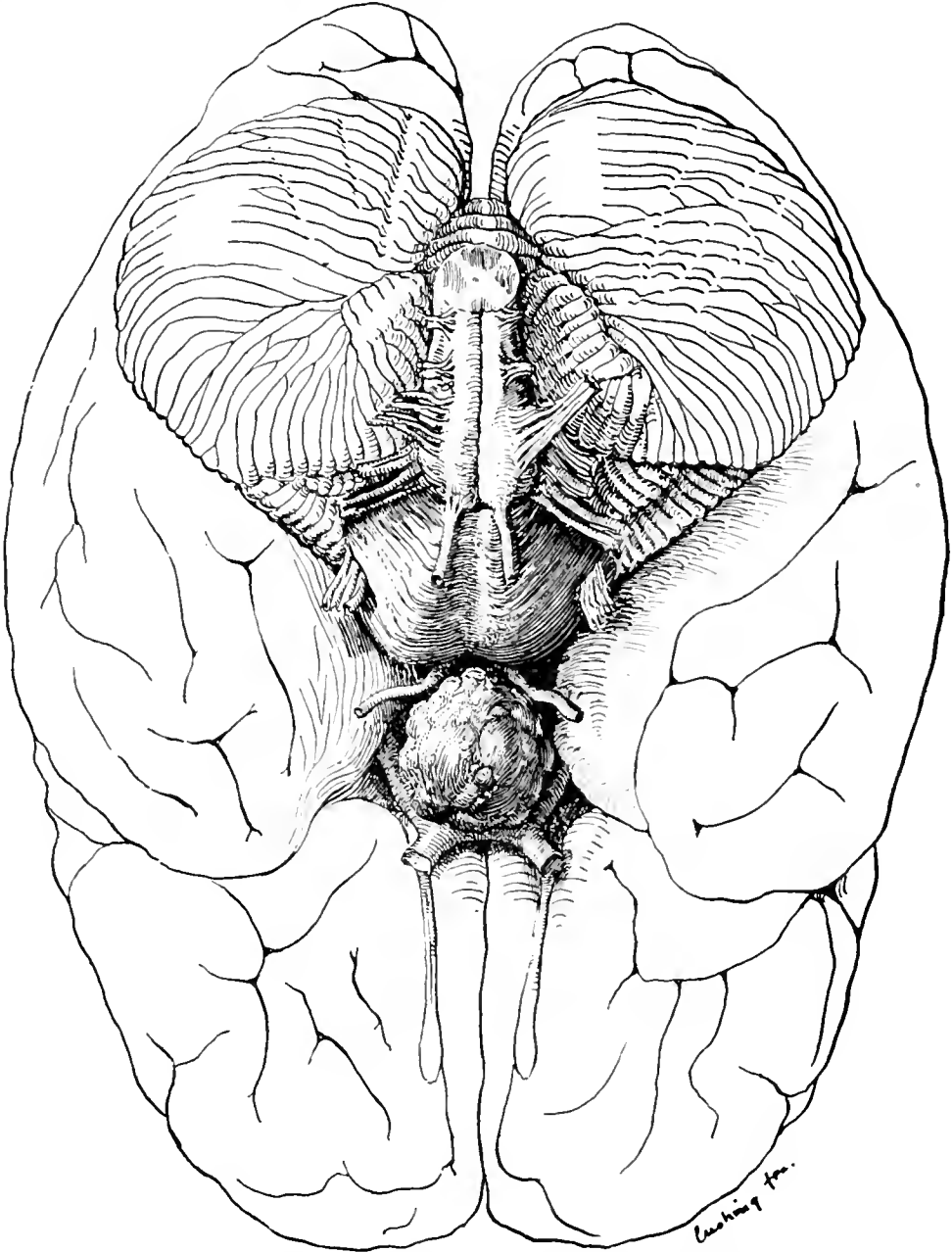


FIG. 2. DRAWING OF BASE OF BRAIN AND TUMOR (CASE I), FROM SKETCH OF THE TISSUES MADE AT THE TIME OF THE AUTOPSY.

third ventricle and an active stasis of fluid in the ventricles of the hemispheres.

Autopsy, May 1st, 1902. An examination was held by Dr. MacCallum, and the immediate cause of death found to be an

extensive broncho-pneumonia. The thoracic and abdominal viscera were otherwise normal. The pelvic organs were well formed, but infantile in appearance.

On removing the brain a hard, nodular tumor mass, the size of a walnut, was found occupying the space between the crura cerebri and the optic commissure (Fig. 2). The tumor was intradural and attached to the leptomeninges, involving and dislocating the structures at the base of the brain by compression alone. The growth occupied the position of the tuber cinereum and overlay the pituitary body, which was small and greatly flattened out. The chiasm was pushed forward and the optic tracts widely separated. The optic tract on the left seemed to be particularly encroached upon, but it retained its normal form. The cranial nerves otherwise were uninvolved.

On separating the hemispheres and dividing the corpus callosum from above, the growth was found projecting under the floor of the third ventricle. The foramina of Monro were both greatly dilated, as were the lateral ventricles. The third and fourth ventricle were of natural size. The substance of the hemispheres seemed somewhat edematous throughout. The ependyma was everywhere smooth.

Sections of the tumor showed it to be a mixed tumor containing cartilage and tissue cells of various other sorts. It was pronounced a teratoma by Dr. Welch. Unfortunately, no histological study was made of the pituitary body.

To summarize and to analyze this case report it would seem that a slow-going, congenital, intracranial tumor, mesially placed and so situated as to compress the hypophysis cerebri, had for years given no symptoms (barring an occasional headache) other than a retardation of sexual development accompanied by some obscure nutritional disturbances. The rather acute onset of intracranial symptoms, with rapid formation of bilateral choked disc, was in all probability due to the final production of an internal hydrocephalus consequent upon the projection of the tumor into the third ventricle. From a tumor in this situation, one might have expected a bitemporal hemianopsia, and had this characteristic symptom been present, a localizing diagnosis would certainly have been made. The only objective evidence of ocular disturbance, before the choking of the discs became apparent, lay in the narrowing of the visual fields and some pallor of the nerve-head.

In the following case the diagnosis cannot be certified, but its clinical similarity to the foregoing one makes it more than probable that a similar lesion is present at the same basal point.

CASE 2. Miss Daisy W., a saleswoman, 26 years of age, was referred to me Dr. Hiram Woods and Dr. H. M. Thomas in March, 1905. She complained of severe headaches and failing vision.

There was nothing in her family history bearing upon her present condition. She was the eldest of a family of four, having three brothers living and well.

As a child she had had whooping cough, diphtheria, measles, typhoid fever and pneumonia. She has always been short of breath on exertion. She has had some bladder trouble with occasional burning on micturition.

She menstruated once when fourteen years of age, but never since then. She gives no history of vicarious menstruation, no nose bleed, etc. She has occasionally noticed some watery discharge from the nipples, and there are periodical shooting pains in her breasts.

She has taken a great deal of morphia for her headaches, and suffers from chronic constipation.

Since she was sixteen years of age she has suffered from headaches, which for the past few years have become more or less constant and at times are very severe. They were at first general in character, but of late have been confined largely to the right side of her head. The pain seems to be extracranial, as well as intracranial, and to extend chiefly into the right trigeminal territory. It is exaggerated by any excitement or physical strain, and may even extend into the neck and shoulder. She sees "balls of fire" at these times.

She has had no nausea or vomiting, though for a year there has been some "distress" after eating. She has lost about ten pounds in weight.

She has been blind in her left eye for four years, the trouble beginning, according to her story, as a temporal blindness. The vision in the right eye has been failing rapidly of late.

She has noticed some dulling of sensation in her right cheek, and has had some tremor in her hands, so that it is at times difficult for her to feed herself. Apart from this, there have been no other manifestations of a motor or sensory nature. For three years she has had occasional "dizzy spells" lasting a few moments, and during which she has to hold on to something. These are followed by a hot flush and by thirst. She has visual hallucinations during these attacks, but has never fallen or lost consciousness during them.

Physical Examination: Before her admission the patient had been examined by Dr. W. W. Russell, who found her sexually infantile. Though rather undersized, she was a healthy looking, well-nourished young woman, with a colorless, waxy look to her face. Her skin was smooth, youthful in appearance, like that of a young girl. There was a certain boggiess of the subcu-

taneous tissue of the extremities (as in Case 1), almost suggesting edema. This was particularly apparent in the hands and feet. The fingers were delicate and tapering. Though there was an abundance of panniculus over the breasts, the glandular structure could not with certainty be palpated, and the nipples were undeveloped.

Eyes. There was a lack of parallelism in the axes of the globes, not apparent, however, at all times. The pupils were considerably dilated and equally so. They reacted promptly to

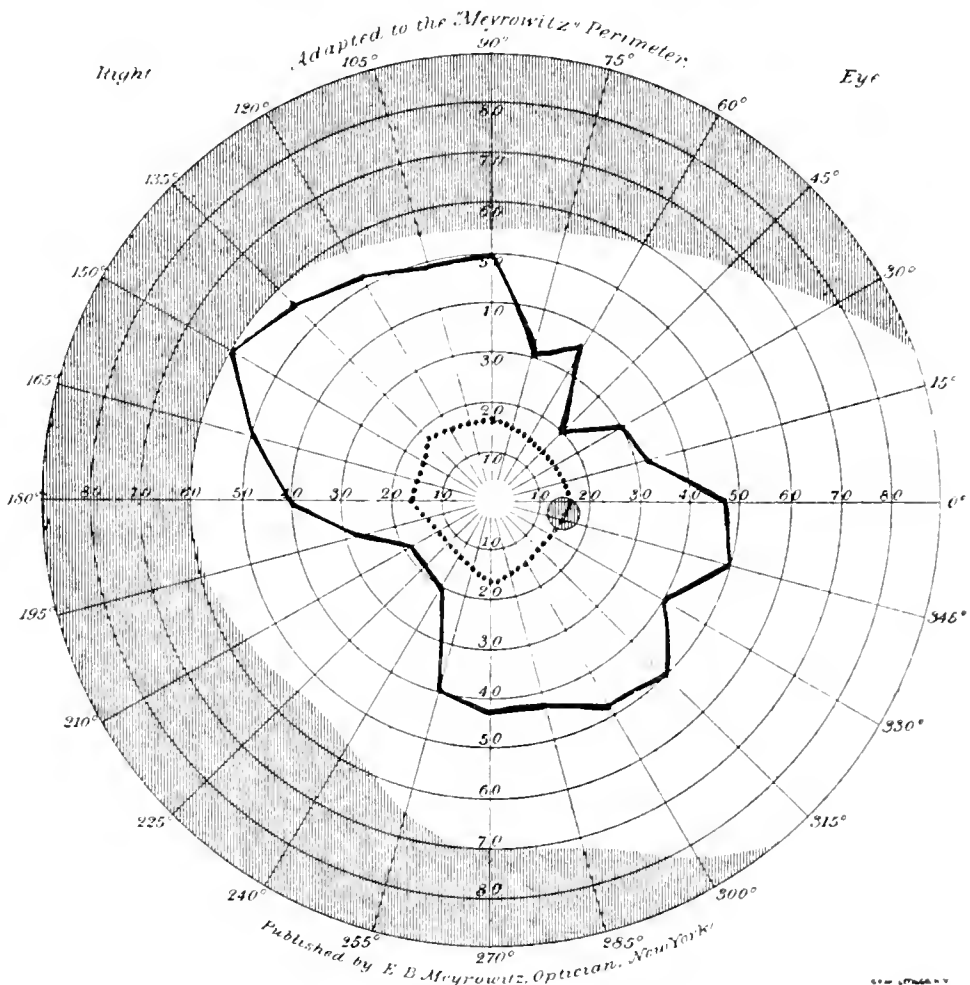


FIG. 3. CASE II. COMPOSITE CHART SEVERAL OBSERVATIONS, MARCH, 1905.

light and accommodation. The left pupil reacted consensually from the right, but there was no left to right reaction. There was no light perception in the left eye. There remained some central vision in the right eye, 20-30, but the field was considerably narrowed (cf. Dr. Wood's chart, Fig. 3). Both nerves showed evidence of white atrophy, more advanced on the left. There was no edema of the disc nor dilatation or tortuosity of the vessels. No nystagmus; no exophthalmos.

The sense of smell was considerably impaired on the right

side; substances recognized promptly on the left were not appreciated on the right.

There was a dulled perception of impulses for pain, touch and temperature over the skin fields of the three trigeminal divisions on the right. The area was also somewhat hyperesthetic to certain forms of stimuli. The other cranial nerves (excepting for the diplopia already mentioned) showed no evidences of involvement.

The patient's intelligence was normal. There was no evidence of motor or sensory disturbance in the spinal fields. The reflexes were normal.

Operation: On March 14th, 1905, a bilateral decompressive craniectomy was performed by the writer's method. Through an intermusculo-temporal approach the thin shell of bone underlying the muscle was rongeué away on each side. The dura was opened on the right side alone. There was but little increase of cerebral tension; the exposed portion of the hemisphere was normal. Both wounds were closed without drainage and healed per primam.

Post Operative Condition: Rather to our surprise, the patient's headaches were greatly relieved, and it is gratifying to state that her vision also slowly improved. The evidence of pressure upon the trigeminus disappeared, and it seems probable that the cranial openings allowed the brain and tumor to lift away from the affected nerves at the base so that they in a measure were able to recover their normal functions.

At the present writing, May, 1906, a year after the operation, the patient has returned for an examination. She is very much better in many respects. Her old intracranial headaches have left her completely. Her vision has greatly improved. An examination of the right eye (the left remains blind), made by both Dr. Woods and Dr. Bordley, shows her vision to be about 20-20. The visual field for form has enlarged considerably, except for the temporal half of the retina, where vision remains contracted as before. It is noteworthy that there is an improvement in the recognition of colors: whereas a year ago there was an uncertain central field for red and no appreciation whatever of blue and green, she now recognizes all colors promptly, though only upon the nasal side (Fig. 4) of the retina. There is a tendency, therefore, not only in the color field, but in that for form, to a nasal hemianopsia.

There has been no return of catamenia during the past year, and certain symptoms have led her physician, Dr. Galloway, to believe that a removal of the ovaries would greatly benefit her. These symptoms are of periodic occurrence, and appear with great regularity every four weeks. She cannot clearly describe her sensations during these "spells," as she calls them. The period of discomfort lasts usually for four or five days, some-

times for as long as an entire week. Several times daily she has a sensation of something rushing up from her body, which gets in her throat and chokes her. She oftentimes has a taste of blood in her mouth, and her nostrils feel raw. During these spells there are visual disturbances, so that she can only distinguish large objects. Consciousness is not lost at any time, but she often has a peculiar sinking sensation. Some time after the

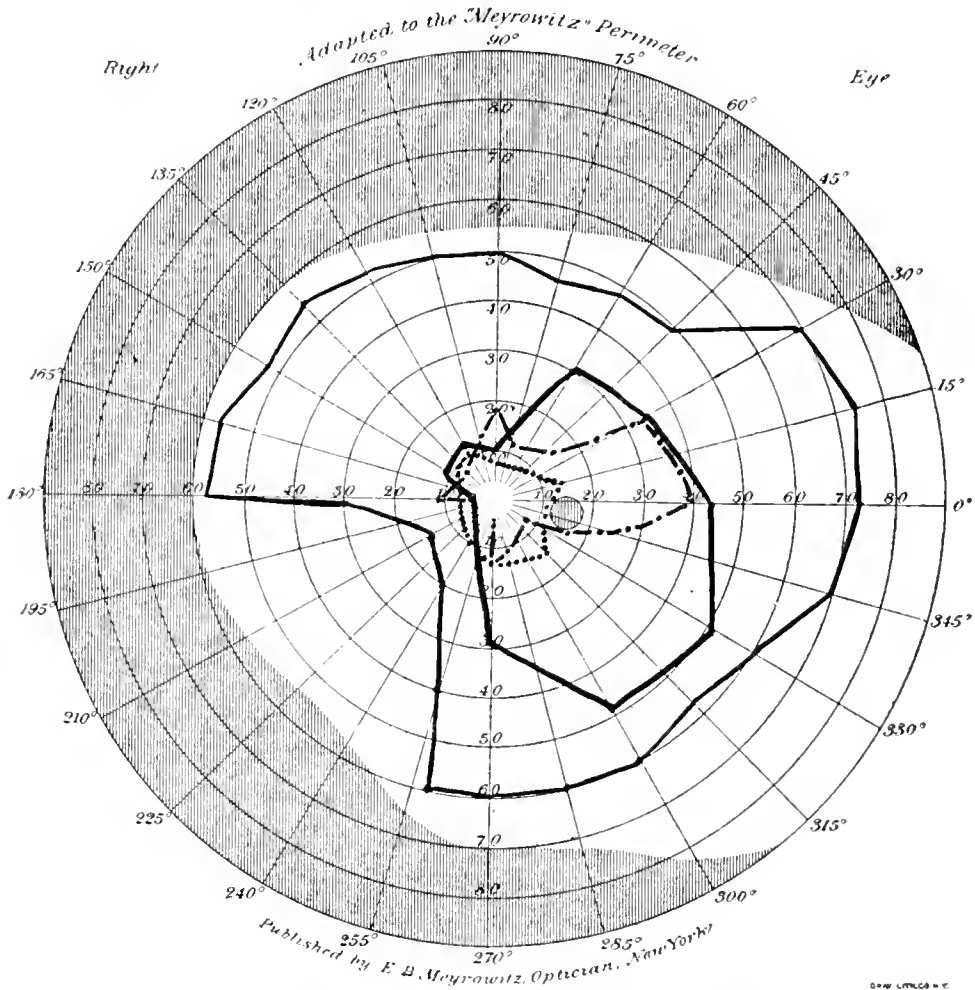


FIG. 4. CASE II. COMPOSITE CHART MAY 23 AND MAY 24, 1906.

spells pass away, her hands do not appear to belong to her. There are bright flashes before her right eye, like tiny specks of fire, and at times millions of scintillating specks. She also at these periods has pain and tenderness on pressure over her left ovarian region.

It is possible that an oöphorectomy may put a stop to this periodic monthly discomfort, which suggests in some respects an attempt at vicarious menstruation. This operation is at present under consideration.

An X-ray taken by Dr. Baetjer has shown that there is a shadow with deformation of the base of the skull in the situation

of the clinoid processes and the sella turcica, which suggests the unmistakable presence of a growth in this situation.

To make a certain localizing diagnosis of brain tumor without autopsy or operation is often difficult enough, but here the bilateral optic atrophy, which we assume to be a primary atrophy, is sufficient to place the lesion in the neighborhood of the chiasm. In a discussion of the effect of hypophyseal or neighboring growths upon the optic tracts, Oppenheim⁸ has shown that the bi-temporal form of blindness is by no means the most commonly produced disturbance, although when it does occur, it is, of course, a most important localizing symptom. There may be simple shrinkage of the visual field in each eye, or unilateral blindness may be present. Ophthalmoscopic examinations may reveal no abnormality in the disc, though in a majority of cases an atrophy sooner or later will be found, and only occasionally a choked disc. As in Case 1, the process has been of such long duration that it may with propriety be considered a benign growth, one probably arising from a congenital *anlage*. The amenorrhea, furthermore, if we are to agree with the opinion of others, shows that the hypophysis has suffered in some way, presumably from compression.

In summarizing these cases one may lay emphasis again on the peculiar association of amenorrhea with hypophyseal tumors and of sexual infantilism in case the process has started early in life. This symptom, together with optic atrophy, may suffice, in the female, to make a diagnosis reasonably certain. In the male sex, as is shown by the cases which Frölich gathered, a corresponding condition may be present. These cases tend to show at the same time certain evidences, hard to describe, of nutritional disturbance, with an abundant development of subcutaneous fat. They do not present any of the appearances characteristic of acromegaly or gigantism.

⁸Oppenheim: "Die Geschwülste des Gehirns." 2 Auflage. Nothnagel's Spec. Pathol. u. Therapie, 1903. Bd. IX., p. 197.

Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION.

Thirty-Second Annual Meeting, Held at Boston, June 4 and 5, 1906.

The President, DR. HENRY R. STEDMAN, in the Chair.

(Continued from page 670.)

The Limitation of Hysteria.—By Dr. Charles L. Dana. Dr. Dana, in his paper, argued that the term “hysteria,” as indicating a special disease, should be limited only to those severe forms of hysteria which are associated with permanent and definite physical and mental stigmata. He also argued that many of these cases, especially the severe types, were really teratological defects, rather than simply “doubting of personality.” In these cases certain associative functions had become worn out and were degenerated and incurable, like forms of torticollis or “occupation” neurôses. He tried to depict a special form of psychoneurosis, to which he would give the name of *psychasthenia*. It was a peculiar mental condition, usually called “hysteria,” and sometimes called “hypochondria” and “neurasthenia.” He thought it was a special form of minor psychosis, and had best be separated from true hysteria as well as from neurasthenia. He thought that it also was somewhat different from the well-marked types of obsession, characterized by doubting mania and morbid fears. The psychoneuroses, therefore, would be grouped under the following classes:

I. The true hysteria.

II. Psychasthenia of the hypochondriacal type, and psychasthenia with obsessions and fears, for all which he gave the general name of *phrenasthenia*.

III. Neurasthenia.

IV. The abortive forms of the major psychoses, such as melancholia, paresis and so forth.

He had been accustomed to use the term *phrenasthenia* to include both forms of psychasthenia; that is, both the hypochondriacal and that type which was characterized by doubting mania and violent types of fears and obsessions.

Dr. Dercum said that the various forms of nervousness resolve themselves into cases presenting well marked symptoms of the fatigue neurosis, neurasthenia, others with well marked stigmata of hysteria, and others still in which the patient presents the symptoms of a confirmed belief in general or visceral disease. Among the latter we frequently find patients who have passed through the hands of a surgeon for various operations; operation for the fixation of a displaced kidney or for affections, real or supposed, of the pelvic organs. Such patients, as is well known, return time and again to the physician for renewed surgical interference. These cases, it is perfectly true, are not cases of hysteria, but should unquestionably be classed under hypochondria. There is another group of cases which resemble neurasthenia, but in which the typical symptoms of over-fatigue are not present, and in which the nervous condition is symptomatic of some general or local disorder which is prodromal to some more serious nervous disease. These cases, for want of a better name, Dr. Dercum had termed neurasthenoid.

Dr. Deady said he liked to be practical about hysteria, and he thought we should try to get rid of all these different conceptions and groups of types of hysteria. There are certain psychological cases, people of highly

imaginative temperaments who always get sick along hysterical lines. There is a type of hysteric who is a perfectly normal person, and when he gets sick his illness is of the hysterical type. Dr. Deady meant functionally, in the sense that whatever happens to that individual he has functional conditions. That person may be neurasthenic or psychasthenic, or anything you wish to call it, but the thing which underlies it all is the subconscious condition. Dr. Prince speaks of curing hysteria. Dr. Deady thought there is no cure for hysteria. We can, however, cure hysteric symptoms. In short, the hysteric is a biological type, born that way, and almost of necessity he is hysterical, and he may do those things and be perfectly normal. For instance, a somnambulist is hysteric, but is normal, and remains that way all his life. If you try any of the methods by which we bring out automatism, he will show the stigmata. The true hysterical cases are always subconscious. In those cases to which Dr. Dana refers, those who rush to bed when there is the slightest trouble, Dr. Deady believed there is a mental lack of reality, a lack of concreteness. The woman who runs to the doctor with the slightest pain is the one that is afraid to cross the street. The hysteric is a normal person who will never get sick except in a hysterical way.

Another point. Alcohol has nothing whatsoever to do with producing hysteria. Hysteria is a distinct variety, and if the parents are alcoholics before the child is born the child may be a degenerate biologically, but he is not necessarily hysteric, and his parents are not degenerate because they are alcoholic.

Dr. Dana said he was much obliged to the gentlemen for their criticism of his paper. He could see that those who differed from him did so because they looked at the question from a different point of view.

He would divide the so-called psychoneuroses into these groups:

I. Neurasthenia.

II. Abortive types of the major psychoses: *e. g.*, melancholia, manic-depressive psychoses.

III. Phrenasthenia, including:

- a. Hysteria major.
- b. Psychasthenia hypochondriacal.
- c. Psychasthenia obsessive.

It is the type III. *b.* or hypochondriacal psychasthenia, sometimes called hypochondriasis, or hysteroneurasthenia, or hysteria, which he would separate as a special group. The obsessive types, such as mysophobia, sometimes develop into a real major psychosis. Hysterical episodes occur in all the groups.

The Pupil in Tabes, Paresis and Syphilis.—By Dr. F. X. Dercum. A brief analysis of the symptoms presented by the pupil in each of the above forms, and especially a consideration of the points of differential value.

Dr. William M. Leszynsky said that the Argyll-Robertson pupil was originally described as myosis associated with loss of reaction to light. It is only when the cervical cord is involved in the tabetic degeneration that we find myosis, and the latter is always accompanied by loss of the pupillary light reflex. The same may be said of the tabetic type of general paresis. In the other forms of tabes and in uncomplicated general paresis, while myosis is absent, the pupils may fail to react to light. We cannot safely lay any stress on the presence of inequality of the pupils alone, without a careful preliminary study of the refraction and the condition of the media.

The teachings of Hutchinson as to the syphilitic basis of abnormal pupillary conditions without intraocular changes, still holds good in a large majority of cases. Unilateral loss of the pupillary light reflex may occur in any of the affections mentioned, as is well-known. In a case of cerebro-spinal syphilis under Dr. Leszynsky's observation this unilateral symptom existed for several years before the other eye became similarly affected. It is not usually recognized that unilateral loss of the light reflex may be a residual condition following a third nerve paralysis. Several such cases.

have been reported in the *Transactions of the British Ophthalmological Society*.

Dr. W. C. Krauss said he had lately made an examination of the eyes of the patients in the Buffalo State Hospital for the Insane with respect to the pupils, and the early appearance of irregularities of the pupils in paresis. In half of the cases examined there existed anomalies in the size of the pupils and in half of these cases there existed the Argyll-Robertson pupil. The appearance of irregular pupils in so-called cases of neurasthenia is of the utmost importance, and as a rule presages an oncoming paresis. When present it is a very important prognostic symptom, and promise of recovery should not be too hastily given.

Dr. Joseph Collins said it seemed to him that one point which deserves discussion is the importance of the inequality of the pupils in patients who have not had syphilis. Is inequality of the pupils in and of itself a sign of any importance, or does it indicate that its possessor is in greater jeopardy of developing paralysis or tabes than one whose pupils are normal? This is a subject upon which we are sadly in need of illumination.

Dr. Knapp thought we are in need of more definite data in regard to the Argyll-Robertson pupil, whether it may occur in persons who are not syphilitic or in persons who are not going to develop paresis or tabes. He confessed that he always looked upon it with grave suspicion, but the data upon this point are still unsatisfactory. If a patient comes before him with this condition he did not think we are justified in saying positively that the patient is syphilitic, or in giving a prognosis that it will probably develop into tabes or paresis.

Dr. H. M. Thomas said that Dr. Dercum's statistics had interested him much, and in one point particularly, where, if he understood correctly, they are somewhat at variance with those given by Professor Mott, of London. Dr. Dercum concluded that optic atrophy is more common in tabes than in paresis, whereas Mott in his monograph on "Tabes in Asylum and Hospital Practice" assumes that in his asylum cases of tabo-paralysis optic atrophy occurred in about 50 per cent. of the cases. The point is an important one as a possible aid to the early differentiation of those cases in which mental symptoms are apt to develop, and Dr. Thomas asked Dr. Dercum if his figures throw any light on this question.

In regard to the pupils in tabes and paresis, there is an action which has not been mentioned, but which is often seen in connection with the Argyll-Robertson pupil, and which at times helps to determine this condition. It is the contraction of the pupil associated with forced action of the orbicularis palpebrarum, and is tested for by directing the patient to close his eye firmly and then to open it, when it will be seen that the pupil has become smaller, and that it gradually dilates in spite of the influence of light. The phenomenon appears to be a normal associated movement which is usually masked by the more active light reflex acting against it, and is, therefore, best seen in a dilated pupil which does not react or which reacts poorly to light.

Dr. Dana said one point in connection with this subject is the great difference in methods of examination. For example, he was talking with an ophthalmologist recently in regard to his method of finding the Argyll-Robertson pupil. He puts the patient in the dark room and throws light upon the pupil. We put our patient into an ordinary room, sometimes in the sunlight, sometimes candle light, sometimes electric light. Dr. Dana suggested some years ago that the ophthalmologist or the neurologist standardize the method. For sometimes it is difficult to say whether there is a pathological pupil or not. He thought if we had a definite uniform method it would make our records more valuable.

Dr. Fisher referred to a case which came under his observation. It was a very slow case of tabes with a markedly dilated pupil. Under anti-syphilitic treatment the dilatation of the pupil (not the Argyll-Robertson

pupil) entirely disappeared, and as the oculist who examined him said, this rarely occurs in tertiary syphilis.

Dr. Dercum closed the discussion.

The question which Dr. Collins asked, whether we should regard the pupil which does not react to light as always indicative of an oncoming tabes, must, he thought, be answered in the negative. It is true that it is usually indicative of an oncoming or an already existing tabes, but not invariably so. He recalled the case of a young woman, a patient studied repeatedly by Dr. de Schweinitz and himself, in which the left pupil was absolutely immobile to light. In this patient, who had also some of the stigmata of hysteria, the symptom persisted during all the time that she was under observation, a period of several years. However, he thought it was of the utmost importance to regard a pupil which reacts sluggishly to light with great suspicion. He was thoroughly in accord with what Dr. Dana said in regard to the method of making the examination, and where the result is in doubt in his own mind he usually had an independent examination made by one of his ophthalmological friends.

.. *The Cerebral Element in the Reflexes and Its Relation to the Spinal Element.* By Dr. George L. Walton and Dr. W. C. Paul. (See this journal, page 681.)

Dr. Knapp said he was not disposed to agree wholly with Dr. Walton in this matter. He thought his rules were certainly too sweeping; as for instance, when he speaks of the complete cutting off of cerebral control causing the abolition of reflexes. For example, Dr. Knapp had seen cases of complete division of the spinal cord where there was loss of the knee-jerk, but with retention of the plantar reflexes, and others with loss of plantar reflexes and knee-jerks. Immediately after a hemiplegic attack there may be an exaggeration of tendon reflexes on the paralyzed side, but sometimes there is a diminution. Occasionally immediately after an epileptic seizure the knee-jerk may be lost, but in other cases it becomes exaggerated to the point of clonus. Therefore, it seemed to him that all these rules are subject to modification.

Dr. Mills said it seemed to him that Dr. Walton and Dr. Paul had not paid sufficient attention to the subject of localization in their consideration of the cerebral reflexes. This appeared to him to be the key to the explanation of the modifications of the reflexes often present. A lesion, such as a tumor or a hemorrhage, involving the cerebral motor zone or the pyramidal tracts, in his experience, almost invariably caused the Babinski response, and increase of the deep reflexes. Parietal tumors and other lesions, whether cortical or subcortical, either caused no change of moment in the reflexes or their diminution. He had several times watched an interesting process of evolution as regards reflex phenomena take place in cases of cerebral tumors. In a case of tumor of the parietal lobe for instance, in which at first the knee jerk was diminished, and a normal plantar reflex was present, but not pronounced, as time went on the knee jerk increased and ankle clonus appeared, while on plantar stimulation no response could be had for a time, and later a Babinski was easily elicited. Evidently this case was one in which a growth at first parietal, encroached later upon the pyramidal tracts and motor cortex. A prefrontal tumor which at first gives no positive reflex disorder may later show the phenomena to be expected in a case of motor region growth.

Dr. B. Sachs said he, like many others, had tried to find a satisfactory explanation of the reflexes. He had felt that particularly in the more chronic cases the presence of sclerotic tissue in the spinal cord acts as an irritant. Cerebral inhibition probably has much to do with it, but it is the presence in the spinal cord of diseased tissue which keeps up the trouble.

Dr. Walton, in closing the discussion, said that the contribution was offered not as completely covering the ground, but as a step in the direction of including in our scheme of reflexes the brain as an integral part working with the cord, instead of an obstructant working in opposition to the

cord. He deplored the conservative tendency which prevents our recognizing, or causes us falsely to interpret, the not infrequent loss of reflexes in cerebral disease. He agreed with Pandi that it is illogical to credit the brain and the spinal cord with opposing functions.

Sexual Infantilism, with Optic Atrophy in Cases of Tumor Affecting the Hypophysis Cerebri.—By Dr. Harvey Cushing. (See this journal, p. 704.)

Dr. Spiller said that primary optic atrophy is not uncommon in tumors of the hypophysis cerebri. Arrest of menstruation occasionally occurs in cases of brain tumor. He had had a case during the past year in which menstruation ceased four years ago. Recently menstruation occurred after improvement following a palliative operation on the skull.

Optic neuritis as a sign of cerebral hemorrhage is regarded, and Dr. Spiller thought justly so, as rare. Within the past few weeks, however, Dr. Spiller had had a case in which it occurred. This sign may lead to a diagnosis of tumor instead of hemorrhage if one is not on his guard.

Dr. Dercum said that there is and must be a close relationship between all the internal secretions, and in cases of this kind it would not be strange if there were interference with the function of other ductless glands than the pituitary, for example of the ovaries. It is also suggestive from the standpoint of acromegaly that in these cases there is no sexual power or desire.

Dr. Joseph Collins said these cases impressed him in a somewhat different way from what they did Dr. Dercum, apparently. It seemed to him that the lack of menstruation is but a manifestation of that disharmonious development of which retention of the pituitary gland is itself an indication. The part of the paper that is of greatest interest to him is that which referred to the statements of some of the clinicians who saw that the patients had edema or that they were on the look out for it. It is quite possible that the pre-hypophysis throws into the economy a secretion similar to the secretion of the thyroid gland, and that one of the manifestations of this secretion is a constitutional condition—one might almost say a cachexia—not similar to it, but analogous to the condition that arises from hyperthyroidization. This condition might likewise account for the ventricular manifestations described in this case.

Dr. Cushing replied in regard to what Dr. Spiller had said concerning the occurrence of choked disc in intracranial hemorrhage. They had found that condition in almost all cases of intracranial hemorrhage.

The cases with loss of sexual power mentioned by Dr. Dercum seem to be quite common.

(To be continued.)

NEW YORK NEUROLOGICAL SOCIETY.

April 3, 1906.

The President, DR. JOSEPH FRAENKEL, in the Chair.

A Case of Cerebral Neoplasm.—Dr. William B. Noyes exhibited a skiagraph taken by Dr. Charles M. Cauldwell which showed a distinct shadow over the ponto-cerebellar region. The case was that of an Italian boy, eleven years old, who had been shown by Dr. Noyes at a meeting of the Society in 1905. There was no history of syphilis nor tuberculosis. The earliest manifestation of his trouble was pseudo-ptosis, first in the right eye, and then in the left. He complained of frequent headaches, located in the region of the right ear and the right frontal region, and vomited at times.

Examination showed a left facial paralysis of a peculiar sort, with continuous spasm and twitching of the orbicularis palpebrarum; blepharospasm; absence of faradic reaction. The tongue showed choreiform movements or a fine fibrillary twitching. There was no paralysis. There was double choked disk. Observation of the case for a month revealed a constant temperature, ranging from 99° or 100° F. in the morning, to 101° in the afternoon. Subsequently, an internal strabismus developed, which was due to overaction of the internal rectus rather than to paralysis of the external rectus. The conjunctiva of the left eye was anesthetic, but there did not seem to be any other fifth nerve symptoms. The left knee jerk became exaggerated, and there was some ataxia on standing with the eyes closed. The headaches recurred frequently, but yielded to ergot. The patient's general health remained good enough to allow him to play in the yard. Paralysis of the legs developed.

The case was regarded as one of cerebral neoplasm, located in the pons, or, according to the view of one observer, in the facial center in the cortex. Dr. Noyes believed that it was located in the pons or in the cerebellum, and pressed on the pons, because of the involvement of so many cranial nerves or their nuclei. The nature of the neoplasm was doubtful, with the exception of the fact that the constant elevation of temperature suggested an abscess. The symptoms, however, seemed too distinctly limited to render that diagnosis probable.

The patient subsequently left the hospital, where he had been under Dr. Noyes' observation, and went to Brooklyn, where he died in the course of a month or so. Prior to his death, he developed paralysis of all his limbs, a stuporous condition and general marasmus. No autopsy was obtained.

The skiagraph showed a distinct shadow in the ponto-cerebellar region, which could not be attributed to mastoid trouble nor ordinary bone thickening. It was not near the mastoid region. The absence of a shadow in the cortex proved that the neoplasm was not cortical. The skiagraph tended to confirm the diagnosis that the lesion was located in the central part, corresponding to the focal symptoms that were observed during life.

Cinematograph Pictures of Neurological Subjects.—Dr. Smith Ely Jelliffe said he was enabled to show these pictures through the courtesy of Dr. Cecil MacCoy, of Brooklyn, and while most of them were examples of nervous diseases which were more or less familiar to all, there was no reason why this same method should not be used, if the opportunity offered, to graphically portray rare and unique neurological subjects.

Among the pictures thrown on the screen was one of nystagmus, showing the movements of the eye; also one marked incoördinate movements in which the diagnosis rested between tic and hysteria. Both of these cases occurred in the practice of Dr. Morton Prince, of Boston. The ataxic movements of the upper and lower extremities in tabes, as well as the characteristic Romberg's sign were also illustrated. Also the characteristic gait of hemiplegia and spastic paraplegia and paralysis agitans, and the movements of the hands in the latter disease. Also knee and ankle clonus, and a case of hysterical intention tremor.

Among the pictures that were shown for diagnostic purposes was one of chronic chorea in a young girl, a case of progressive muscular dystrophy, and one of petit mal.

Dr. Cecil MacCoy, of Brooklyn, said that most of the pictures shown by Dr. Jelliffe were taken by him last summer more or less as an experiment, and with the idea that they could be used in connection with his work at the Long Island College. Cinematograph pictures of various clinical conditions had been used very extensively abroad for the instruction of students, and Doyen, of Paris, made it a rule to have all of his operations photographed in this way, so that his patients, when convalescing, could be shown just what surgical technique had been employed. In this way, too, the students could follow the various steps of the operation.

Dr. MacCoy said he was making an effort to introduce this method of photographing operations on the eye, and he had also made the suggestion to orthopedic surgeons that the method would be of value in connection with their work.

Chemical Problems of Neuropathology.—Dr. Carl L. Alsberg, of the Laboratory of Biological Chemistry of Harvard University, in presenting this subject, said the limitations of chemical research in the field of neuropathology were so great, and the work was so extensive, that investigation along these lines might still be said to be in its infancy. Most of the work that had thus far been done was speculative or incomplete, and the subject could best be discussed by referring to the problems in neuropathology that had been already attacked, or that were still to be attacked by the chemist. These problems could conveniently be divided into three groups; namely, those that had to deal with intoxications; those that had to deal with chemical anatomy or pathology, and those that had to deal with questions of metabolism in diseases of the nervous system.

A study of the effect of lead and other similarly well-known toxic agents on the nervous system had developed a better and more rational treatment of those cases, but in the vast majority of the conditions of the nervous system that were supposed to be due to an intoxication, the nature of the supposed toxic agent was quite unknown to us, and we did not even know whether it was an intoxication or something else.

One of the most important problems in this connection that the chemist had to deal with was to search out the intoxicating substance. This applied also to the intoxications that were due to the acute infectious diseases. It did not do very much good to know that syphilis caused this or that disease, if we were ignorant of the poison that was formed by the syphilitic virus. The results of serum therapy had been so brilliant that they had dazzled the eye, and perhaps to a certain extent were responsible for the neglect to investigate the chemical character of the poisons of those particular diseases. Of course, the isolation of those poisons involved a very complex problem, but the speaker thought its solution was within the range of possibility. There was no reason why any poisonous substance, whether the product of a bacterium or not, should not be studied chemically. If it was possible to isolate the active principle of snake venom, and the poison of a bee's sting, as had been done, and produce immunity thereby, the speaker said he saw no reason for the contention of some bacteriologists that the nature of the poison of infectious diseases was so complex that it was not susceptible of chemical investigation.

Aside from investigating the nature of the toxins that cause various nervous diseases, it was very important, in the same connection, to study the histology of the nervous system, the inter-relationship of the various parts of that system, and the relative susceptibility of those parts. Study along these lines was best done by experimental intoxications with toxic agents specially selected by pharmacologists as adapted to this end.

Apart from any experimental work of this nature it was necessary to consider under intoxications the various forms of auto-intoxication. The commonest was that known as acidosis, to which condition was attributed many of the nervous symptoms exhibited by various patients. The importance of the condition, Dr. Alsberg said, had probably been overestimated, and he was inclined to regard the excretion of acetone and B-oxy-butyric acid and other acids in the urine as secondary to lack of proper nutrition or starvation. The occurrence of acidosis in many surgical conditions, in the course of which it had frequently been reported, could be explained on that basis.

Another rather common form of supposed auto-intoxication was that attributed to the presence of indol and skatol absorbed from the intestines as a result of abnormal putrefaction, although there was no positive evidence that these were really causes of auto-intoxication. Many regarded

them merely as manifestations of intestinal putrefaction, and believed that other substances that were as yet unknown were present in addition to the indol and skatol. Still, that was merely begging the question.

Another form of intoxication that had been studied by the French school, Bouchard and others, was the toxicity of the urine. It had been definitely proven that the toxicity, or, more properly, the hypertoxicity of the urine was due to the presence in the urine of potassium and other salts. There was no evidence that the urine was very toxic. It contained toxic substances, to be sure, but these were found in normal as well as pathological urine, and we had no proof that any definite pathological conditions were due to this factor.

Dr. Alsberg said the search for toxic substances had been extended not only to the urine and blood, but also to the cerebrospinal fluid. Normally, the cerebrospinal fluid contained very little albumin, but in cases where there was wasting of nervous tissue the percentage of albumin was increased. In certain cases the quantity of cholin in the cerebrospinal fluid was also found to be increased, and some believed this to be an active factor in the causation of the convulsions in epilepsy. The presence of cholin seemed to be of value only in differentiating between organic and functional nervous conditions. In the latter class of cases it had never been found to be increased, excepting in instances of doubtful neurasthenia.

Other pathological factors in the cerebrospinal fluid in cases of wasting disease of the nervous tissue were absence of sugar and the presence of an excess of phosphoric acid. The freezing point and alkalinity of the cerebrospinal fluid had also been studied. The latter had been done by the titration method, which for that purpose was now recognized as quite unreliable, and practically of no value. In wasting diseases of the brain the degenerated tissue became richer in water and poorer in solids, and consequently its specific gravity was lowered. The quantity of substance that could be extracted with ether was also diminished, as was the absolute amount of phosphorus.

Coming to the question of metabolism in nervous diseases, Dr. Alsberg said that this aspect of the problem was the most complex of all. In the first place we were not in a position to state that metabolic changes in the muscular tissues had their counterpart in the nervous system. No one was able to show that accompanying hard mental labor there was an increase in the oxygen intake or in the carbonic acid output. Therefore, we were at a loss to know what to look for. The effect of work on the muscles can roughly be studied, but not on the nerves. Any such change must of necessity be very slight, and the results thus far obtained in experimental work along this line had been negative as often as positive. The only conditions in which definite results had been obtained were those in which there was wasting of the nervous tissue, as in general paresis, and sometimes an excessive excretion of phosphorus had been reported. Still, very little could be assumed from that symptom alone, as there were deposits of phosphorus in the bones and other tissues besides the brain. Furthermore, it was known that the metabolism of the phosphates was influenced by the metabolism of acids and by the internal secretions of the sexual glands, and that both these factors played a part in these nervous diseases, thus further complicating the interpretation of the results.

Probably, complete metabolism studies, including the analysis of the feces, and the respiratory gases, as well as of the urine, conducted for long periods, would succeed where the shorter and less complete investigations have failed.

Dr. P. A. Levene said the aim of chemical investigation in the course of disease was either to elucidate the general mechanism of the pathological condition, or to discover the faulty function of one of the internal organs which might be the primary cause of the disease. The difficulty of the latter problem lay in the readiness which was demonstrated by one organ

to compensate for the insufficiency of the other, and furthermore, in the fact that a diseased organ might perform its work fully if only a small part of it remained intact, and thus the actual condition escaped the observer.

Notwithstanding all the difficulties certain progress had been made in diagnosing incipient insufficiency of internal organs. However, in studying the relation of the pathological condition of internal organs to insanity and nervous diseases, one was struck by the irregularity of the relationship. There were described numerous cases of insanity caused by diseased conditions of the digestive tract, or the liver or other organ; numerous histories were recorded in which the disease was asserted to have been occasioned by the accumulation of one or of another product of general metabolism, but the proportion of this number to that of similar cases not thus complicated with nervous symptoms was rather small. It seemed therefore profitable that the cause of insanity should be attributed not so much to the given abnormal function of one organ, nor to the usual action of a given product of metabolism, but rather to the peculiar susceptibility of certain individuals to the irregularities in the function of a certain organ, or to the action of a certain product of metabolism.

Was it possible to detect these individual peculiarities by the aid of chemical methods? No effort in that direction had thus far been made. However, it was known that in some pathological conditions the manner in which the organisms reacted to certain chemical substances was different from that in health. Thus, a normal individual was very slightly susceptible to tuberculin, or to uric acid or the carbohydrates, while in disease the same substances might give rise to distressing symptoms.

It was possible that the cause of many neuropathological forms might be found in the abnormal susceptibility of certain individuals to alter normal products of metabolism, or to the mineral tissue or the food components.

Dr. Jelliffe said that he could add very little to this discussion from the chemical standpoint. As an introduction to what he would say, he called attention to the fact that even as far back as the time of Hippocrates it was held that the brain functions were located in four juices of the body, and if these were dammed back, they would give rise to delirium, dementia, terrifying hallucinations, and ideas of suicide. This was the initial stage of an auto-intoxication theory for nervous and mental disorders, now so widely discussed and concerning which so little definite was known.

The remarks of Drs. Alsberg and Levene, Dr. Jelliffe said, had already indicated what a complex problem we had to deal with in this subject; how widespread an investigation it required, and how much time and money and laboratory facility were necessary to arrive at a true interpretation of the relations of metabolic disorders to nervous pathology. For himself, while looking somewhat askance at the general notion of auto-intoxication and mental disorders, he felt that there were lines of closer differentiation to be drawn, and that there were undoubtedly some auto-toxic factors that entered into the production of certain mental states.

It was advisable, at the outset of this discussion, to eliminate most of the chronic psychoses, particularly the manic-depressive and paranoid types; their relations to the problem of the evening were far from being advantageously considered in the light of our present knowledge.

A number of acute conditions, notably the deliria associated with alcoholism, with cocainism, with hashishism, with acute febrile disturbance, etc., might very rationally permit of an interpretation from a chemical basis of intoxication. When it was borne in mind what mental symptoms might follow the continued ingestion of minute quantities of lead, of arsenic, of mercury, of ergot, and that subtle changes might result from modification of the iodine proteid in the thyroid gland, as seen in myxedema, it was not illogical to assume that long-continued poisoning or

even acute poisoning from products resulting from defects of detoxication on the part of the body might result in nervous or mental lesions.

The study of the human detoxications was still in its infancy. Many poisonous products were more or less imperfectly known; these resulting from the breaking down of the proteids and the fats. Some of the more important of these were diacetic acid, B oxybutyric acid, acetone, indol, phenol, para-cresol, and a number of others. While it was highly improbable that all of these, perhaps any of these, played any casual rôle in the development of mental phenomena, beyond the well known deliria, coma and toxic states seen in diabetes, or in uremia, yet he believed it rational to continue the search for related products, in that they might be shown to be instrumental in causing nervous modifications, or even neurone degenerations.

Chemical detoxications took place in almost all tissues of the body, and there was a great play of compensatory detoxication constantly going on, yet the liver was undoubtedly to be considered the most important detoxifying organ of the body. While Kleppel and Faure had described a special psychosis due to hepatic insufficiency, their observations were in need of more exact proof and verification.

Raimann's patient, with a Korsakoff psychosis, due to profound digestive derangements, was unique, and needed others to establish a relation, but even these showed a drift, not an easy acceptance of superficial auto-intoxication hypotheses, towards a chemical basis for the elucidation of disturbed metabolism in mental disorders. The oxidative functions of the liver were in much need of further study. Such studies profited much, particularly in the study of detoxification; for lessened oxidative function played a highly important rôle in determining tissue degenerations. While the subject of sub-oxidations was almost as nebulous as that of auto-intoxications, pharmacological research was offering more than pure conjecture.

Dr. Jelliffe also spoke of Marinesco's studies on lowered blood pressure, and the resultant neurofibril degenerations caused thereby. Whether these might be interpreted from the nutritive standpoint, or bore any relation to the subject of cell changes in anemia and lowered blood pressure, and the resultant sub-oxidations, was still undetermined. The subject, he concluded, of perverted chemism and neuropathology must be left open. It was a vast quagmire of speculation and generalization, but beyond all he thought there were many solid places, and the future would undoubtedly show more.

Dr. A. N. Richards called attention to the unsatisfactory character of the evidence regarding indol and skatol intoxications. He described experiments performed by Dr. John Howland and himself which showed that when the power of oxidation of the cells of the body was diminished, as by the injection of potassium cyanide, the symptoms caused by the administration of moderate doses of indol became much more prominent. They attributed these symptoms to the decreased detoxification of indol, and its consequent accumulation in greater quantities in the central nervous system.

Dr. Adolf Meyer said that coming back from the generalities in which some of the speakers had indulged, and which bore only a very distant relation to the subject under discussion and showed how liberally the clinician referred to the chemistry of the future, he wished to refer to the work of I. Coriat, which was mentioned as having been done under the speaker's direction.

The work referred to was in connection with the estimation of the amount of indol in certain cycles of motor disturbance, with both increased and decreased motor activity. The valuation placed on the presence of indol, Dr. Meyer said, seemed to depend very much on the temperament of the investigator, and in some of the early reports, some

very startling results had been recorded. More recent work had led to the conclusion that a great deal depended on the amount of fluid that was eliminated during the states of hypokinesis. If there was but little urine secreted, a small amount of indican would of course give a deeper color.

Dr. Meyer thought we should be rather guarded with inferences from the interesting experiments which had been referred to by Dr. Richards, as they would be apt to mislead those who were craving for results in their clinical search for indican.

Dr. Arnold Lorand, of Carlsbad, Austria, called attention to the fact that there was clinical and experimental evidence showing that the nervous system and metabolism were in very close relation. Metabolic disturbances were not infrequently observed after nervous disorders; thus, glycosuria, or even diabetes, might be observed after nervous emotion or shock, and the same was true of gouty attacks. On the other hand, in the course of diseases of metabolism, such as diabetes and gout, nervous troubles, such as neurasthenia, insomnia, etc., were very frequent.

There were also certain nervous diseases attended by positive alterations of metabolism. Thus, it had been shown by Prof. Magnus Levy, of Berlin, and also by Thiele-Nehring, Mattes, and others, that in Graves' disease, the processes of oxidation were augmented, while in myxedema they were diminished. Those two diseases, as was well known, were caused by alterations of the thyroid gland, and it had been shown by several writers, especially by Magnus Levy, that by thyroid treatment we were able to increase the processes of oxidation in persons suffering from myxedema. There were also other ductless glands which produced similar results; namely, the ovaries and testes. It had been shown by Prof. Loewy and Docent Dr. P. F. Richter, assistant to Prof. Senator, of Berlin, that after castration of those glands, the processes of oxidation were diminished, while by ovarian treatment they could be augmented.

The degeneration or extirpation of the above ductless glands, Dr. Lorand said, could also produce obesity, as he had shown in a paper presented before the French Congress of Internal Medicine, Paris, 1904, and in the *Medicinische Klinik*, of Berlin, March 27, 1905. Such cases of obesity he had called endogenous obesity, as they had nothing to do with obesity resulting from overnutrition. They could be produced by all those agencies which might cause a degeneration of the thyroid or sexual glands, or the pituitary body. Thus, after extirpation or degeneration of the above glands caused by infectious diseases (Roger and Garnier, Bayon, de Quervain, Crispino and Jorri), or resulting from successive pregnancies, especially associated with prolonged lactation, or from sexual excesses, or after tumors of the pituitary body, obesity had frequently been observed. Madelung had lately published in the *Beitrag zur Klin. Chirurgie*, 1903, a case of colossal obesity after a shot wound of the pituitary body.

Besides metabolism, these glands also influenced the nervous system in a powerful way. Thus, all alterations in these glands were followed, as a rule, by marked nervous symptoms. It was especially observed that the thyroid gland exercised an influence upon all those functions which had their location in the cortex cerebri. These included intelligence, remembrance, will-power and sleep. In myxedema all those functions were impaired, and sleepiness was a marked symptom. Sleepiness was present, as a rule, in all processes of degeneration of the thyroid gland. It was also associated with certain cases of obesity. The influence of the thyroid upon obesity was also shown by the fact that we were able to produce a considerable decrease of fat by thyroid treatment.

In speaking of the sleeping sickness, Dr. Lorand said that in a paper presented before the last German Congress of Internal Medicine at Wiesbaden he had shown that that disease was due to the action of the trypanosoma toxins upon the thyroid, which was affected in many infectious

diseases. This produced a condition of myxedema which presented the same symptoms as sleeping sickness, the resemblance being not only clinical, but also pathological as regarded the anatomical findings of the central nervous system. He also mentioned that Hessler, in a case of catalepsia published in the *American Journal of Medical Sciences* a few years ago noted rapid improvement after thyroid treatment. Finally, he stated that by giving the serum of goats whose thyroid was extirpated, he could produce marked hypnotic effects in every case of insomnia.

That the sexual glands influenced the nervous system was shown by the frequent occurrence of nervous symptoms, even psychoses, after alterations of the sexual glands, especially the ovaries. This was seen during menstruation and pregnancy, and at the time of puberty and the menopause. In all these conditions, also, the thyroid gland was often swollen.

Dr. Lorand said that in cases of melancholia he had found alterations of the thyroid and ovaries. Recently, in the Pennsylvania Insane Asylum, he had seen two cases of dementia in adult males who had scarcely any growth of hair on the face, and who had small, undeveloped testicles. In another case of imbecility in a young man of eighteen years there was the same absence of hair on the face, associated with infantilism and cryptorchism.

PHILADELPHIA NEUROLOGICAL SOCIETY.

March 27, 1906.

The President, DR. D. J. MCCARTHY, in the Chair.

Acute Myelitis in a Boy.—Dr. Ralph Pemberton presented the case and said that acute myelitis in childhood, other than acute anterior poliomyelitis, or that due to compression, tuberculosis or syphilis, has received relatively scant attention from either neurologists or pediatricists.

For example, Gowers in his last edition, dismisses the question with a few lines; Oppenheim barely touches on it, mentioning a case consequent upon slight traumatism in a girl of eight. Sachs, in his text-book on the "Nervous Diseases of Children" is about as brief; while Starr in "Diseases of the Nervous System," and Rotch in the "Diseases of Childhood" barely mention it. More satisfactory accounts, however, are to be had in Holt, Ashby and Wright, and Keating, in their respective works on pediatrics. In the so-called idiopathic variety of myelitis, Holt is inclined to ascribe the etiologic factor to an infectious process; while Oppenheim regards it as an unrecognized trauma, slight enough perhaps to have escaped notice, but of a severity sufficient to produce lesions.

All authorities are apparently agreed that acute myelitis of this variety is very unusual in childhood, particularly under the age of ten; and according to Holt, the prognosis is extremely poor, the majority of cases progressing from bad to worse. Mary Putnam Jacobi, however, in Keating's "Cyclopedia of the Diseases of Children," retails a series of eight cases of which two recovered entirely and two were greatly improved. The onset was gradual in all of these but one, an adolescent of eighteen, and this is the rule, according to Holt; early local symptoms being followed by more diffuse symptoms as the disease progresses.

Ashby and Wright in their work on pediatrics devote rather more space to it, and consider the chances of recovery greater in children than in adults, as the cord seems to recover more readily in early life than in later years. They regard the dorsal region as that part of the cord most commonly affected, and lay some emphasis on cases which have been reported as

occurring during measles and convalescence therefrom; the relation being apparently closer than with other infectious diseases.

There have been no cases of myelitis in children reported in the *Archives of Pediatrics* for the past three or four years. The following case of acute diffuse myelitis in a boy is of interest because of the age of the patient and the acute onset. J. D., white, fourteen years.

Family History.—Essentially negative, and patient has escaped all the diseases of childhood except measles some years previously, though he states that every winter he has been subject to pains in his legs, which were attributed to rheumatism. Since twelve years of age he has worked intermittently in a glass factory, where he was exposed to considerable heat from the furnaces.

History of Present Illness.—About three months prior to admission, after a full day's work in the glass factory, he was suddenly seized with cramps in his hands while reading a book at his own house. He had felt perfectly well all day, had eaten a hearty supper, was not aware of having become more overheated than usual while at work, or of having become chilled after it. He waited to cool off as usual before leaving the factory, and then walked about seven squares to his home.

In a few minutes after the onset as above, the cramps of the hands extended to his arms and radiated to the shoulders. After being rubbed for a few minutes by some of his family, he felt better and tried to walk, but fainted. He was unconscious about ten minutes, and on "coming to" found he was paralyzed in both arms and the left leg. On the advice of a doctor he was given a hot bath and put to bed. He had a comfortable night, but by the following morning he had lost power in the other leg, and Dr. J. H. Locke, who first attended him, states that he had general anesthesia from the neck down. He seems at this time to have had incontinence of urine and feces, and since then has been confined to bed.

Examination.—On admission to Philadelphia Hospital, Feb. 26, 1906, service of Dr. Charles W. Burr, by whom the opportunity of reporting the case was given. Patient is an unusually intelligent boy of about fourteen years, rather undersized and considerably emaciated, with a marked pallor of skin and mucous membranes. Speech is smooth and distinct, and there are no palsies of face or tongue, which is clean and free from tremor. He lies preferably on his right or left hip, with both shoulders touching the bed, the thighs flexed on the abdomen and the legs flexed on thighs. The undermost leg is advanced the more and both legs touch the bed throughout their entire length. There is no deformity of the spine, and it is not tender to palpation, but over the sacrum and lower lumbar region there is a bed-sore as large as a man's hand, and extending down to the bone. There are also trophic sores on both heels and over the external malleolus of the right ankle. The arms can be freely though weakly moved in all normal directions, and while the grip is present in both hands, it is greatly impaired. His hands are held usually with a partial flexion of all fingers. The fingers of the left hand can all be extended, the index better than the others, but in the right hand power of extension is lost in all but the index finger, which can be but partially extended. There is more power of flexion of the forearms than of extension, though both are weak and the hands can be well flexed and extended on the forearms. There is some atrophy of the scapula, humeral and forearm muscles, but the wasting is most evident in the hands where the simian hand is present on both sides, with marked atrophy of the adductors of the thumb. No reflexes can anywhere be obtained in the upper extremities. The chest expands not at all with respiration, which is entirely abdominal. The heart and lungs seem normal and the abdomen is protrudent, though soft and yielding to palpation. The liver apparently extends a few cms. below the costal border, the spleen is not palpable and there is flaccidity at all times of the abdominal muscles, though the rectus abdominis reflex is slightly present on both sides. The testicles are partially undescended and the cremasteric reflex cannot be well

tested. The right patellar reflex is absent, but on tapping the patellar tendon on the left, the sartorius muscle contracts. There is no plantar reflex on the right side, but stroking the left sole causes an attempt to withdraw the left leg as a whole. Ankle and patellar clonus and Achilles jerks are absent. Tactile sensation, temperature and pain senses are apparently normal over the entire body, except on the outer aspect of the right leg below the knee, where they are distinctly dulled. He has incontinence of retention of urine and incontinence of feces, though he says his urine formerly dribbled. During the examination he suddenly voided with much force a large quantity of urine.

Urinalysis of Feb. 27, 1906, showed: Alkaline reaction; spc. gravity of 10.20; color, deep yellow; albumin, faint trace; microscope, leukocytes and phosphates.

Examination of Blood, March 6, 1906, showed: Hb., 62%; R. B. C., 4,800,000; W. B. C., 10,680.

March 27, 1906—Since admission his temperature has three times reached 100° F., but his temperature chart, otherwise shows nothing abnormal. He has gained weight, is considerably brighter, and shows some return of power. It is impossible to completely extend either leg on the thigh as contractures prevent this beyond an angle of about 140°. From this position of partial extension, however, he can entirely flex the left leg on the thigh, but the right not at all. Neither can it be voluntarily extended in the least degree. The trophic sores on his feet have practically healed, the sore on his back is filling up rapidly, and the biceps reflex is now present on both sides to the normal extent.

Dr. Alfred Gordon said the patient had been at the Jefferson Hospital in Dr. Dercum's service for over three months. He entered about five or six weeks after the onset of the disease. When he was brought to the hospital there was absolute paralysis of all four extremities, with marked hyperesthesia and marked tenderness of all the nerve trunks of the four extremities. The symptoms began in the upper extremities, then extended to the lower extremities. The onset was rapid. Dr. Gordon thought at first the case was one of Landry's paralysis. It was atypical in distribution. He was kept under observation and the diagnosis was changed to cervical myelitis. The bedsores the patient presented were very unusual, they extended rapidly, formed, closed and reformed in various places. At one time the sacrum was exposed by the bedsores. The patient developed a sore on the prepuce with suppuration. He also had pus in his urine. The practical point of the case was the treatment. He was put on iodide in gradually increasing doses, and it was remarkable (for it was an experiment), that when he was given the iodides the bedsores healed nicely, and granulations formed, then he would show symptoms of intolerance to iodides. As soon as the iodides were discontinued the bedsores spread and became worse. Again treatment was resumed, there was rapid improvement in the bedsores, but he soon showed intolerance to the iodides and they were discontinued. The patient developed during his stay at Jefferson Hospital very high temperature (105°), had difficulty in breathing several times, but the wonderful resistance the patient presented was astonishing.

Dr. Burr said one interesting thing about the case was that the causation was not known. Myelitis as a rule is secondary to something else, at least the disease first appears in some other organ as pneumonia or acute infectious fever, and secondary to that the spinal cord symptoms develop. In this boy the statement of the family physician is positive that he was previously a perfectly healthy boy. Dr. Burr thought that exposure in the glass works and cold afterwards gave opportunity for the myelitis to arise.

A Patient with Amyotrophy of the Intrinsic Muscles of the Hands Due to Lead Intoxication.—This case was exhibited by Dr. Alfred Gordon.

Dr. Pickett mentioned that lead poisoning of the ulnar nerves would

give atrophy of the small muscles of the hand, and that this atrophy in Dr. Gordon's case might be peripheral.

Dr. Gordon replied that the ulnar nerves supply the interossei muscles. The patient had also atrophy of the thenar and hypothenar eminences. They were affected first, the interossei next. The thenar and hypothenar muscles involved at the same time remind us rather of progressive muscular atrophy of spinal type. He thought that the lead affected the cells of the anterior cornua, and did not think the atrophy was from degeneration of the ulnar nerve.

Dr. Pickett said that without opposing Dr. Gordon's view of this case he suggested, contrary to the accepted teaching, that possibly an occasional selection of the ulnar nerves by the lead, might account for this semblance of the claw-hand. In a recent case seen with Dr. Pfahler of typical ulnar neuritis, verified by the existence of the proper area of anesthesia, he found the atrophy of the thenar eminence extensive, evidently more than in one head of the short thumb-flexor. Perhaps in such a case disuse of the hand, particularly as regards the thumb, by paralysis of its adductor, increases the thenar atrophy. Not being familiar with the literature he did not know whether this peripheral hypothesis is new or not.

A Patient with Intermittent Collapse of the Retinal Vessels was exhibited by Dr. McCarthy and Dr. F. D. Harbridge.

Dr. Harbridge said the patient complained of absolute blindness, sight beginning to leave invariably on the nasal side of the field, and affording the sensation of a thin veil gradually being drawn before the sight, this becoming denser and denser until vision was absolutely lost, the loss of vision lasting from one to five or six minutes, when it gradually returned, always on the temporal side of the field and with a peculiar play of lights—phosphenes.

In 1898 he had several severe attacks of vertigo, and subsequent to this he has been subject at more or less frequent intervals to severe attacks of migrainous headache, possibly every month, so severe that he was compelled to remain absolutely quiet. He did not have neuroretinitis. There was merely a haze of the upper and lower borders of the disk, not in the true sense of the word a neuroretinitis.

Dr. Harbridge had been unable to find any record of exactly a similar case; that is, a case in which repeated opportunity afforded itself to observe a spasm of the retinal vessels in which there was not, sooner or later, a more or less permanent injury.

Dr. Weisenburg did not believe this case to be one of tabes. In tabes even a low grade neuroretinitis such as was described in this case never occurred. Again, why should there be intermittent collapse of the retinal vessels in tabes. Tabes is a disease of the sensory neurones, and he could not see how such ophthalmological changes could be associated with the disease. Again, granting it to be tabes, the symptoms elicited are not convincing of such diagnosis, as the disease is systemic, and unilateral symptoms would be most unusual.

Dr. Camp thought possibly the case was one of those of ophthalmic migraine that have been observed with collapse of retinal arteries and sometimes migrainous attacks and sometimes only an attack of blindness.

Dr. McCarthy, closing, said that he observed this patient during the attack and there was no change in the heart or pulse. The man was pale as if in terror of losing his sight, though this may well have been a condition of sympathetic derangement. The ocular manifestations may be considered as a complication of an aberrant form of tabes dorsalis. In view of the etiology of tabes dorsalis, he saw no reason why a patient with tabes should not have neuroretinitis. The optic nerves, as he understood it, are in the early stage of primary degeneration. There was narrowing of retinal vessels and with the condition of the disk practically typical of primary atrophy. Were it bilateral he would still hesitate to make a positive diagnosis of tabes. The only case in which tabes was diagnosed

from one set of symptoms and later came under his observation was a case presenting ataxia; later the case was diagnosed as posterior lateral sclerosis by another neurologist, and still later as spastic paraplegia by a third; autopsy showed it to be one of multiple sclerosis. He therefore rather hesitated to diagnose a case from one group of symptoms. This case was shown before the ophthalmological section of the college. This is the only case of its kind reported.

A Large Tumor of the Basal Occipito-Temporal Region, and a Tumor of the Cerebellopontile Angle, with Brief Remarks on the Symptomatology of the Cases.—These were presented for Dr. Mills by Dr. Weisenburg.

Dr. Lloyd said he was astonished that these tumors ever escaped the knife of the surgeon. He should have supposed that they would have been cut out. He believed it was customary nowadays to cut out tumors even from the cerebellum, although the mortality returns are not yet all in. He thought the cerebellopontile angle must be a favorite seat for brain tumors. He had in his office a specimen of brain tumor taken from a Blockley patient years ago, lying in almost the same region.

The Distribution of the Sixth Cervical Anterior Root in the Spinal Cord.—This paper was read by Dr. A. R. Allen.

The Temporary Disappearance of the Sensory Symptoms in Syringomyelia.—This paper was read by Dr. Burr.

Report of Neurofibrillar Changes in a case of Hydrophobia and One of Pernicious Anemia, with Remarks Upon Lesions of the Neurofibrils in Pathological States.—This paper was read by Dr. G. E. Price.

April 24, 1906.

The President, DR. D. J. MCCARTHY, in the Chair.

Herpes in the Distribution of the Right Cervical Nerves, Possibly Tabetic in Origin.—This case was exhibited by Dr. S. D. Ludlum.

Dr. Spiller thought this an interesting case because of the possibility of herpes as an early sign of tabes. There is evidence in the literature that herpes may be a sign of tabes.

Dr. Gordon said trophic disturbances are not uncommon in tabes, but a zoster eruption is quite rare. According to some, herpes zoster is due to a disease of the spinal ganglia, while others believe it is the result of a peripheral neuritis, and others still that the spinal cord is at fault. Head's conception of the origin of herpes zoster is very interesting. He found associated with the usual changes in the cord in tabes inflammatory conditions in the spinal ganglia. Head finds a certain relationship between the localization of the eruption and the inner organs. Rauschke has recently published a case in the *Centralbl. für Nerv. u. Psych.*, No. 188. A woman suffering from tabes presented an eruption of herpes zoster, whose appearance coincided with an attack of gastric crisis. At another time an identical eruption appeared simultaneously with bladder disturbances. The stomach, according to Head, is in relation with the seventh and the ninth thoracic segments. The area of the skin affected with zona was at about this level. The depressor of the bladder is in relation with the eleventh and twelfth thoracic segments. The eruption was also at about this level. Rauschke's case therefore leaves no doubt as to the central origin of herpes zoster.

Partial Monocular Ophthalmoplegia in which there is Paralysis of the Upward and Downward Movements and of Convergence in One Eye only without Loss of Associated Bilateral Movements.—This case was presented by Dr. J. H. Lloyd.

Dr. Mills thought there was probably a partial atrophy of the third nerve rather than a unilateral disturbance of convergence.

Dr. Dercum also thought there was partial third nerve atrophy, but thought it must be a nuclear palsy.

A Patient with Paralysis of Associated Upward Ocular Movements and a Patient with Multiple Sclerosis.—These were exhibited by Dr. C. S. Potts.

Dr. Weisenburg stated that he had opportunity to study Dr. Potts' case a number of times. At first he thought the lesion was a cortical one, but he agreed now with Dr. Potts that the lesion was probably in the thalamus, although the case was by no means clear. In many respects this case was similar to one reported several years ago by Klien, in which, as a result of a traumatic lesion of one parietal lobe, with probable involvement of the posterior portion of the frontal lobe, there resulted ataxic movements of the eyeballs, besides other symptoms. This case showed that a unilateral cortical lesion may cause ataxic movements of both eyeballs, and it could be argued that permanent paralysis of associated ocular movements may result from unilateral cortical lesions. This, however, is improbable. As Klien's case was without necropsy, it loses some value.

Dr. Dercum said he had a case almost similar in character to the case reported by Klien, which Dr. Weisenburg mentioned. In his case there was also a lesion in the second frontal convolution, with ataxia of the eyeball and nystagmus.

Multiple Motor Neuritis.—This paper was read by Dr. Wm. G. Spiller and Dr. W. T. Longcope. Cases of rapidly developing paralysis of all four limbs are not common. Undoubtedly many classed as Landry's paralysis are caused by neuritis, but to assume that all have this etiology, as some writers have done, is unjustifiable. The literature of Landry's paralysis has become so extensive that it is inadvisable to review it. The subject has recently been discussed by Hans Lohrisch, and the report of his case among others shows that Landry's paralysis may be spinal in origin.

Rather than to discuss the subject of Landry's paralysis separately, the authors had preferred to include it under the heading of multiple motor neuritis. As already said, they did not ignore the spinal form of this symptom-complex. Believing, as they did, that many cases with the symptom-complex known as Landry's paralysis are cases of multiple motor neuritis, they sought a cause for the first manifestations of the paralysis in the lower limbs. The ingenious theory of Edinger must give us the answer. The nerves of the lower limbs are most employed, and these may be most susceptible to poisons, and we have in Landry's paralysis, as in tabes resulting from another poison, the symptoms first manifested in the lower limbs.

They recently had had an opportunity to observe three cases that might be classed as Landry's paralysis, two with necropsy, but they preferred to regard them as atypical forms of multiple motor neuritis; atypical in the rapidity of their development. Multiple neuritis sometimes develops very rapidly, and one of the authors (Dr. Spiller) had in his service recently at the Philadelphia General Hospital a case in which complete paralysis of all four limbs, with great tenderness of all the muscles of the limbs to pressure developed in about twenty-four hours.

In the first case studied, a man of fifty-two years of age, the paralysis developed rapidly, ascending and involving the upper extremities. Sensory symptoms were present, but of short duration. They consisted of pains in the calves of the legs and tendons of the muscles of the arms and legs. The motor symptoms persisted. In the second case, a man of sixty, there was rapid ascending flaccid paralysis terminating fatally in four days. Reflexes were absent. Sensory symptoms were present at first. At autopsy the spinal cord and brain showed no changes macroscopically or microscopically. The peripheral nerves were not examined. The third case

differs from the other two in that there were no sensory disturbances, and belongs clearly to the group of Landry's paralysis. There was ascending flaccid paralysis without sensory symptoms and with loss of the deep reflexes. The control of bladder and rectum was retained until death, which occurred eight days after onset of the symptoms. The microscopical examination of the nervous system showed that the symptoms were caused by degeneration of the motor cells of the anterior horns, of the motor fibers in the peripheral nerves, and of the muscles. The case is remarkable in that the recent degeneration of the muscles, as shown by the Marchi method, was intense and out of proportion to the alteration of the nerve cells of the anterior horns and to the degeneration of the nerves. To these three cases of motor neuritis, in all of which the paralysis of all four limbs developed within twenty-four or forty-eight hours, the authors added an unpublished case of lead palsy with necropsy, as an example of still another form of multiple motor neuritis.

A Case of Traumatic Hematomyelia was exhibited by Dr. F. X. Dercum.

Dr. Lloyd stated that it would appear that this man had an entire absence of the pectoralis major muscles. This reminded him of a case he had at Blockley, where there was congenital absence of the pectoralis major muscle. On looking into the matter he found several such cases reported. Most of these cases preserve a wonderful degree of physical strength, as did Dr. Dercum's patient.

A Case of Hematomyelia Not of Traumatic Origin.—Dr. Spiller reported the following case that had been in his service in the Philadelphia General Hospital: About four years previously the patient had what was supposed to be spinal meningitis. He recovered, but probably had thickened blood vessels of the spinal cord. He had been in excellent health and was employed at the time the hematomyelia occurred (December, 1905) in an ice house, and with another man had been lifting blocks of ice weighing 100 pounds. He had lifted four of these blocks before any symptoms were noticed. Fifteen or twenty minutes after lifting the last block he began to have pain between the shoulders, and felt numb and weak in the upper extremities. Ten or fifteen minutes later he felt weak and numb in the lower limbs, and was then brought to the hospital. Dr. Spiller examined the man first in January, 1906. He had then recovered largely the use of the lower limbs, but these limbs were somewhat spastic. He had normal sensation for touch everywhere. The patellar reflexes were exaggerated and Babinski's reflex was present on the right side. He had much impairment of temperature and pain sensations in the upper part of the thighs, over the trunk as high as the first or second rib, and in both upper limbs. He had incontinence of the sphincters of the bladder and rectum. He was almost completely paralysed in the upper limbs, and these limbs were much wasted. Dr. Spiller thought if hematomyelia could be diagnosed clinically surely this was a case.

Dr. Lloyd said that spontaneous hematomyelia was a very rare condition. So very rare, indeed, that a few years ago it was generally denied. He recollected that when Dr. Dercum published his book on "Diseases of the Nervous System" he did him the honor to ask him to write the chapter on hematomyelia, and Dr. Lloyd found it extremely difficult to obtain anything in the literature about it. A few years before that time Dr. Kindred had put on record a case in the *Medical News* which was nearest to a case of true spontaneous hematomyelia that Dr. Lloyd had ever seen recorded. A man of fifty-seven years of age, in perfect health, was seized suddenly with pains between the shoulders and in the chest, simulating angina pectoris, and died in a few hours with all the symptoms of paralysis of the spinal cord. A large clot in his cord was found, causing the cord to bulge and completely disintegrating the interior of it. In a recent work on this subject, a monograph by a French author, Lépine, a few cases of so-called spontaneous hematomyelia had been collected.

The question of causation is from a scientific standpoint most interesting. It has always seemed strange that the pathology of the vascular system which plays so large a part in the brain has so little field in the spinal cord. It has been stated by Gowers that emboli are never found in the spinal cord below the level of the medulla. Dr. Lloyd thought this an extreme statement, but the fact remained that we do not have alterations taking place in the blood vessels of the spinal cord and subsequent vascular lesions, the condition which the Germans call Rückenmarkapoplexie, nearly so frequently as in the brain. It is, as has been said, an extremely rare condition. He thought most of the cases reported had been very rapidly fatal. This was a fine scientific question. Dr. Lloyd felt there was doubt about the diagnosis in the present case. The man claimed that his condition came on him suddenly, but we know we have to take with a grain of salt the statements of patients. He presents symptoms of marked degeneration. The paralysis is mostly confined to the upper limbs with atrophy; he could walk fairly well, and he had exaggerated reflexes of the lower limbs. His case presents some resemblance to syringomyelia or to amyotrophic lateral sclerosis. If he had spontaneous hematomyelia it must be in a region of the cord where it catches both anterior horns, makes some pressure on both descending lateral tracts, and practically leaves the rest of the cord without much change. It would be hard to locate one hemorrhage in the spinal cord which would exactly answer for all these lesions.

The question has been raised elsewhere whether in some cases of syringomyelia we did not have the inception of the disease in a condition of hemorrhage. There may be, it was suggested, a hematomyelia in the cord followed by degeneration and cavity formation. That is a point yet to be decided. There were one or two conditions we should always bear in mind in regard to the differential diagnosis of hematomyelia; for instance, there was the possibility of the rapid onset of hemorrhagic myelitis that might be mistaken post-mortem for hemorrhage in the spinal cord.

In the caisson disease, caused by working in compressed air, hemorrhages have not, as a rule, been found, but there is a necrotic process, which apparently has some mechanical cause, possibly thrombi in the blood vessels.

Dr. Hawke said the patient was admitted to the alcoholic ward of the Philadelphia Hospital in 1902. He had then delirium tremens. This was followed by typical symptoms of cerebrospinal meningitis. He was in a delirious and semi-conscious state for several weeks. After possibly three months he convalesced and remained around Blockley ever since. Dr. Hawke thought this previous condition might be a factor in determining his present diagnosis.

Dr. Gordon said in regard to a possible hematomyelia: If we look at the so-called spontaneous diseases of the cerebrum, we will find a condition similar to this; for instance, internal hemorrhagic pachymeningitis without apparent cause. They had lately a case at the Jefferson Hospital, which Dr. Dercum mentioned at the last meeting, a man apparently perfectly healthy and well, was taken with somnolence, mental hebetude and so on. He finally died, and internal pachymeningitis was found. The man was about sixty-four or sixty-six years of age, without trauma or history of intoxication.

In regard to this present case, do we know about the syringomyelia disturbances before he came under observation of a physician. A number of patients walk around never suspecting any sensory disturbances, any sensory disassociation. Perhaps the patient had a syringomyelia before. Then collapse took place, and, whatever it may be, affected the anterior cornua and produced the present condition. Dr. Gordon did not say it was not a primary hematomyelia. He did say it was possible it was a plain case of syringomyelia, because we do not know anything about the sensory condition before the trouble came on. Dr. Gordon had read of one or two cases of hematomyelia in the spinal cord. Can we be positive in a

case like this when it presents so many features analogous to other affections of the spinal cord.

Dr. Weisenburg believed that the case was one of non-traumatic hematomyelia and not one of syringomyelia, for the following reasons: If this case were one of syringomyelia, the clinical symptoms were at variance with the pathogenesis of the disease. Syringomyelia is a disease of mal-development, the symptoms of which come on early in life, and it would be rare indeed to have a patient with syringomyelia in whom the symptoms did not appear until the forty-eighth year.

The criticism had been made that to explain the sensory symptoms there would have to be a large hemorrhage or a cavity throughout the whole length of the spinal cord. Dr. Weisenburg did not believe that there was such a lesion, but thought a single hemorrhage involving both the gray matter and the column of Gowers of each side would easily explain the sensory symptoms, and that this lesion was limited between the fourth cervical and first thoracic segments. Again Dr. Weisenburg did not believe that the state of the sensation was such as is usually found in syringomyelia, for here he would expect sensory changes of a more or less segmental type.

Dr. Spiller said that some of the objections to the diagnosis were that it was a case of syringomyelia, that possibly the man had had these sensory disturbances before the accident occurred, that it could not be a hemorrhage involving a large portion of the gray matter, that spontaneous hematomyelia was a very rare disease, and therefore it could not be hematomyelia. That hematomyelia does occur we know, and had the case not been unusual he would not have presented it. As for this being a case of syringomyelia, he had never heard of syringomyelia developing within a half hour. There was no reason to doubt the man's statements, and it was very clear that paralysis developed while he was doing heavy lifting, and he was positive he had been in good health previously. As for its being a case of hemorrhage into a cavity, there is no way of diagnosing that condition clinically. Hemorrhage is more likely to invade the gray matter, and a hemorrhage in the lower cervical and upper thoracic regions in the gray matter and anterior portion of the cord would explain all the symptoms. The sensory changes made a diagnosis of amyotrophic lateral sclerosis improbable. Dr. Spiller referred to the fact that tubular hemorrhage extending through a great distance in the gray matter of the cord is well known. The objection of one of the speakers that the man may have had the syringomyelic disturbance of sensation before the sudden development of his palsy may be answered by saying that the existence of such pronounced sensory symptoms without motor disturbance would be improbable. That motor weakness did not exist is shown by the fact that the man was employed in heavy lifting. By this method of reasoning not a man present in the audience could exclude the existence in his own person of a latent brain tumor, but it was not probable that such lesions existed. Again, it is not customary to find that persons previously in good health suddenly developing paralysis have been subjected to a careful examination shortly before the paralysis occurred.

Dr. C. D. Camp read a paper on hemianesthesia.

Dr. Alfred Gordon exhibited a brain showing sclerosis on the left side.

Dr. Spiller reported two cases in which the Gasserian ganglion had been removed, the pressure sense being preserved, although all other forms of sensation were lost.

Dr. C. F. Martin read a paper on the "Sphincter Reflexes in Tabes and Paresis."

Dr. Charles H. Muschlitz read a paper on "Overflow Reflex Manifestations in Dementia Præcox."

Periscope

Neurologisches Centralblatt

(Vol. 25, No. 1, Jan. 2, 1906.)

1. Concerning Fibrillar Structures of Progressive Paralysis. K. SCHAFER.
2. Associated Nystagmus. STRANSKY.
3. Arsenical Neuritis. J. CRUZEN.
4. Sudden Death in Tabes. HIRSCHBERG.

1. *Progressive Paralysis*.—Not suited to abstracting.

2. *Associated Nystagmus*.—Stransky described under this term in 1900, a nystagmus of the eyeballs which was obtained by forcing the eyelids apart, the patient endeavoring to close them. He does not consider this of reflex origin, but likens it to the fluttering of the eyelids in neurotic individuals, and explains it by the transmission of impulses from the facial and ocular nuclei to the posterior longitudinal bundle.

3. *Arsenical Neuritis*.—The author records a case of arsenical neuritis in which the source of infection was through the skin of the hands.

4. *Sudden Death in Tabes*.—Hirschberg records a case of sudden death in a tabetic probably due to an endarteritis of one of the bulbar arteries, affecting the heart center. There was no autopsy.

(Vol. 25, No. 2, Jan. 16, 1906.)

1. A Hitherto Undescribed Symptom of Paralysis of the Palate. (Alteration of speech in an Erect and Lying Position). H. SCHLESINGER.
2. A Peculiar Form of Amaurotic Family Idiocy. W. SPIELMYER.
3. A Contribution to the Etiology of Tay-Sachs' Disease. W. STERLING.

1. *Paralysis of the Palate*.—Schlesinger has observed that when such a patient is in a horizontal position there is no disturbance of speech, but when in an erect position the disturbance is quite marked.

2. *Amaurotic Family Idiocy*.—The author describes a peculiar family disease which has some resemblance to amaurotic family idiocy only in the fact that the disease occurs in families and that optic atrophy occurs. In a family of four children only the eldest escaped. The disease in all began about the sixth year, with psychic alterations and epileptic attacks, and ended with retinal and optic atrophy. They all died at the age of puberty. The examination showed intense alterations of the ganglion cells.

3. *Tay-Sachs' Amaurotic Family Idiocy*.—Sterling records an additional case with necropsy. From the sixth month psychic changes were observed. The author believes that the disease is due to a defect of development of the nervous system. He gives in order the cases with necropsy reported in the literature. He fails to give credit, however, to the recent case reported with necropsy by Spiller.

(Vol. 25, No. 3, Feb. 1, 1906.)

1. Concerning the Measuring of the Brain Volume. V. BECHTEREW.
2. A Case of Fracture of the Base of the Skull, with Rare Nerve Palsies. Contribution to the Physiology of the Ninth, Tenth and Eleventh Cranial Nerves. R. BALINT.
3. Necrosis Paralysis of the Crural and Obturator Nerve. S. KLEMPERER.
4. Small Motor Epilepsy. V. PLAVRE.

1. *Brain Volume*.—The author describes a method for measuring brain volume.

2. *Fracture of the Base*.—Balint records a very interesting case in which, as a result of a fracture, there resulted a paralysis of the ninth, tenth and eleventh cranial nerves. As a result of the paralysis of the ninth there was disturbance of taste in the posterior portion of the tongue. Because of paralysis of the vagus, there was loss of sensation in all parts of the pharynx and larynx, besides motor weakness of the stomach and intestines. The heart and lungs were not in any way altered in function. Because of the involvement of the eleventh nerve, some involvement of the sterno-mastoid, and total involvement of the trapezius. The author argues therefore that the trapezius is wholly supplied by the accessories and the sterno-mastoid partially. It was a singular fact that there was no displacement of position as a result of this paralysis.

3. *Necrosis Paralysis*.—By forcible flexion and abduction of the thighs during a gynecological operation lasting over three hours there resulted a paralysis of the crural and obturator nerves.

4. Continued article.

(Vol. 25, No. 4, Feb. 15, 1906.)

1. Concerning the Material Changes in Association Development. GOLDSCHEIDER.

2. Syphilis and Dementia Paralytica in Bosnia. NÄCKE.

3. Small Motor Epilepsy. PLAVEC.

1. *Association Development*.—Article not suited for abstracting.

2. *Syphilis and Dementia*.—In an interesting article the author calls attention to the fact that in some countries, as in Bosnia, in which syphilis is very common, tabes and general paralysis are not. This interesting fact has been long known. In Japan and China, for instance, where syphilis is very common, neither tabes nor paresis is a common finding, although in recent years since the introduction of modern civilization and its invariable higher intellectual strife, these diseases have increased. It would argue that the increase of intelligence and mental effort had a direct bearing on these diseases, which is in fact so. The nature of the syphilitic virus, according to Näcke, is only a contributory, not a necessary cause. He inclines to the view that there may be a specific and congenital tendency necessary also for the development of these diseases.

3. *Motor Epilepsy*.—Continued article.

(Vol. 25, No. 5, March 1, 1906.)

1. Concerning Changes in Structure of the Ganglion Cells and Their Associations in the Central Nervous System in a Case of Congenital Cerebellar Atrophy. STRÄUSSLER.

2. The Hypnotic Proponal. KALISCHER.

3. Small Motor Epilepsy. PLAVEC.

1. *Changes in Ganglion Cells, Etc.*—Article not suited for abstracting.

2. *Hypnotic Proponal*.—Article not suited for abstracting.

3. *Small Motor Epilepsy*.—Plavec means by this term attacks which consist in a local spasm without disturbance of consciousness and without aura. It is difficult to differentiate them from hysteria, reflex spasms and those due to cortical lesions, known as partial motor epilepsy. Some authors speak in this sense of the occurrence of "tic" with epilepsy, others of abortive epilepsy or of motor equivalents. Binswanger believes that there may be besides, true epilepsy "tics." Féré believes that these, however, are of epileptic nature. Cases are quoted in which "tics" even for a long time thought to be such were finally shown to be epilepsies. (Féré, Binswanger, Sims and Bernhardt.) The diagnosis of small motor epilepsy is difficult, partly because of the occurrence of so-called myoklonia which occurs in 5 per cent. of the cases of epilepsy. Some regard these as accidental, others as part of the epilepsy. According to Féré the myoklonias may be limited to only a few muscles, and differentiated from tic only by the fact that in the former neighboring muscles are involved. He suggests that paroxysmal myoklonia may be of epileptic origin. Aura in idiopathic

epilepsy is not as common as that due to organic and reflex causes. As to time of attack, idiopathic epilepsy may occur at night, tic and hysterical attacks never. Reflex epilepsy may occur at night, but there must be for this an organic cause. Jacksonian attacks may also occur at night. Féré and Binswanger believe that idiopathic epilepsy may be due to an organic origin, and that Jacksonian attacks may be only part of idiopathic attacks. Jacksonian attacks do not come on as often at night as idiopathic attacks. Larrailhe collected from the literature 133 attacks of cortical epilepsy in 61 patients. Of these, 76 attacks occurred by day, 14 by night, and 43 in indifferent times. Féré states that in Jacksonian (cortical) epilepsy the patient is always awakened, so he is compelled to live his whole attack, whereas in idiopathic epilepsy the patient is awakened from sleep in those attacks, which, during the day, would cause him to lose consciousness. Small motor epilepsy may involve in its spasms not necessarily antagonistic muscles, but may cause intentional movements, as rotary tic, tic de salaam, conjugate deviation of the eyeballs, etc. An important symptom is the more or less paralysis of parts after an attack. These occur most often after the cortical and organic cases, but cases are on record in which after reflex and idiopathic attacks this occurred. The paresis may be overlooked, as it may last only a few minutes, at times an attack may manifest itself as a temporary weakness, and this may occur without loss of consciousness. (Binswanger and Gowers.) More often than after the attack weakness may be observed during the spasm. (Cases quoted of Kjellmann and Siebert.) Epileptic weakness may be in the form of sensory changes, diminution of visual fields. In a case of Féré's diminution of fields was for green only. This may occur also as an aura. Disturbances of sensation for touch may also occur. Vaso-motor disturbances may occur in attacks. Binswanger believes that irritation of vaso-motor centers is a constant attribute of abortive epilepsy as the motor symptom. Also disturbances of secretion (salivation and sweating) can occur simultaneously. Psychic disturbances may occur in epilepsy in a paroxysmal manner. The differential diagnosis between abortive epilepsy in which no loss of consciousness is apparent and other attacks of epilepsy and hysteria is almost impossible, unless in the former loss of consciousness is made apparent. The author gives the history of a case in which a boy at eleven years of age had what was considered a tic, but five years afterward had abortive epilepsy and then genuine epileptic attacks.

(Vol. 25, No. 6, March 16, 1906.)

1. A Contribution to the Question of Tabes-Paresis-Syphilis. HÜBNER.
2. Is There Autogenetic Regeneration of Nerve Fibers? MÜNZER and FISCHER.
3. Autogenetic Nerve Regeneration. RAIMANN.
4. Contribution to the Diagnosis of *Cysticercus Ventriculi Quarti*. OSTERWALD.

1. *Tabes-Paresis-Syphilis*.—Hübner investigated the histories of a large number of prostitutes and came to the conclusion that tabes and paresis occur more often in this class than any other, also that miscarriages are more apt to occur in persons suffering from this disease, and gives the history of two families in which only those infected with syphilis developed tabes and paresis.

2 and 3. *Autogenetic Nerve Regeneration*.—Raimann, directly after Bethe's original contribution, attempted to confirm Bethe's work, only to find opposite results. Bethe in his later work confirmed with a mass of what seemed indisputable evidence his former conclusions. The authors again took up the question and in a series of experiments on lower animals by Bethe's method found that there was regeneration in those cases only in which the central and peripheral stumps united, opposing the autogenetic theory. Münzer severely criticizes Bethe's views.

5. *Cysticercus Ventriculi Quarti*.—Cysticerci occur more often in the fourth ventricle than in other localities. The author gives two additional

cases in which the diagnosis was made during life and confirmed by necropsy.

(Vol. 25, No. 7, April 1, 1906.)

1. A Reflex Phenomenon Made Apparent by Plantar Flexion of the Foot and Toes in a Case of Disease of the Central Motor Neurone. BECHTEREW.
2. Schäfer's Antagonistic Reflex. LASAREW.
3. The Dual Foot Reflex. MENDEL.
4. Experimental Research in the Anatomy and Physiology of the Posterior Spinal Roots. Preliminary Communication. KOPCZYNSKI.
5. The Development of the Microcephalic Skull. VOGT.

1. *A Reflex Phenomenon*.—Bechterew describes another reflex which he considers indicates disease of the central motor neurone. By forcible plantar flexing of the foot and toes there is an immediate dorsal flexion of the foot and toes. In great spasticity there is also a flexion of the knee and hip joint.

2. *Schäfer's Antagonistic Reflex*.—In 1899, Schäfer described a new reflex which was obtained by pinching the tendon of the gastrocnemius muscle, and obtaining extension of the toes. He considered it an antagonistic and paradoxical reflex. He investigates further and concludes that it is obtained in any disease of the motor neurones, and that it is a modification of the Babinski.

3. *The Dual Foot Reflex*.—Mendel reasserts his belief that the reflex he first described in 1904 is of distinct value. It is obtained by percussing the dorsum of the foot, there resulting a dorsal flexion of all toes. In motor diseases plantar flexion of the toes is obtained and extension of large toe.

4. *Posterior Spinal Roots*.—In a very important work the author gives his conclusions only. He cut the posterior spinal roots in four apes, of the types of the *Macacus Rhesus*, and killed them at the expiration of thirty days. In his physiological conclusions he agrees in the main with other investigators. In the hand distribution the first dorsal root is of the most importance. Cutting all the roots supplying the limb produced only temporary motor paresis and ataxia, and considerable flaccidity and atrophy of the muscles.

(Vol. 25, No. 8, April 16, 1906.)

1. Casuistic Contribution to the Knowledge of Sensory Ataxia. GOLDSCHIEDER.
2. A Contribution to Our Knowledge of the Perception of Optic Impressions in Alcoholic Psychoses, Especially in Korsakoff's Psychosis. GREGOR and ROEMER.

1. *Sensory Ataxia*.—A man of forty-four years, of alcoholic history, developed paresthesia of the right lower limb. He had considerable weakness, no disturbance of ordinary sensation, but much ataxia and loss of the sense of position. There was no pain on pressure over the nerve trunks, and no loss of the tendon reflexes. Later there was loss of the patellar jerk and some atrophy. In a short time the symptoms of ataxia and loss of sense of position disappeared and the patient became well. The author regards it as a case of polyneuritis of alcoholic origin.

2. *Perception of Optic Impressions*.—Article not suited for abstracting. WEISENBURG (Philadelphia).

Revue de Psychiatrie et de Psychologie Expérimentale

(January, 1906.)

1. Work in the Treatment of the Insane. DR. MARIE.
2. Observation of a Microcephalic. DR. DAMAYE.

1. *Work in the Treatment of the Insane*.—A strong plea for the value of agricultural pursuits in the treatment of insanity, and a recommendation that steps be taken to increase the facilities for this kind of work in asylums in the department of the Seine.

2. *Microcephaly*.—The findings in a case of microcephalic imbecility. The patient was thirty-five years of age, with the mental development of

five or six. The occipito-frontal diameter was 13.7 cm. The bitemporal 11.2 cm. The brain weighed 534 gms., did not present any special asymmetries. Microscopically the cells appeared smaller and less numerous than normal, and to this the author attributes the lack of mental development.

(February, 1906.)

Researches on the Dreams of the Marquis d'Hervey-Saint-Denis. M. N. VASCHIDE.

Researches on Dreams.—A critical review of the work of the Marquis d'Hervey-Saint-Denis, published in a volume entitled "Dreams and Means of Directing Them," and consisting of an experimental study and observations made upon himself.

Le Marquis d'Hervey believes that there is no sleep without dreams, and supports this view by experiments showing people to be actually dreaming, who, when awakened, will avow that they have not dreamt at all. He also believes that there is no sleep without thought, at no moment of sleep do the attention, the will, the intellect, cease to functionate. The will has a predominant influence on the construction of dreams and the dreamer can at will modify, guide, direct, and aid the evolution of the capricious architecture of dreams.

(March, 1906.)

1. The Asylums for the Insane of the Seine and Their Population. DR. H. COLIN.

2. Pseudo-Rabic Intoxication. DR. J. LEVASSORT.

1. *The Asylums of the Seine.*—A statistical study of the asylums of the Seine with a discussion of the reasons for the great increase in the number of patients. Of little interest to American readers.

2. *Pseudo-Rabies.*—Five cases are cited of pathological alcoholic intoxication in which the patients were wild, making murderous attacks, attempting to bite persons or even trees, bed clothes, etc. Certain of these cases had been diagnosed as true hydrophobia.

(April, 1906.)

1. Contribution to the Study of Cerebral Lesions Among the Insane. L. MARCHAND.

2. Researches on the Buccal Reflex. R. LAMBANZI and C. PIANETTA.

3. Delirium of Negation and Organic Lesions. A. VIGOUROUX.

1. *Cerebral Lesions Among the Insane.*—This paper is summed up in the following conclusions:

The principal cerebral affections one encounters among the insane are chronic meningitis (meningo-corticalitis), chronic or subacute meningo-encephalitis, encephalitis, cerebral vascularity, cerebral atheroma, cerebral sclerosis, cerebral tumors. To this enumeration may be added cerebral cellulitis, a new appellation to indicate the primitive and unique lesion of the psychic cell.

The same cerebral disease occurring in subjects of the same age, may give different mental syndromes. The same mental disease occurring in subjects of different age gives mental syndromes totally different.

Different cerebral diseases may give identical mental syndromes.

Mental symptoms, even mental syndromes cannot alone explain the cerebral disorder of which they are symptomatic. The examination of the sensibility, of the motility, of the functions of language are indispensable. Psychiatry is only a small branch of neurology. What gives it its importance are its relations to legal medicine and sociology.

2. *Buccal Reflex.*—The buccal reflex is produced by percussion in the neighborhood of the labial commissure which causes the lips to partly close and some time after make a movement of projection. This action is a portion only of this complex act of sucking and is presided over by a branch of the fifth nerves which innervates the muscles and skin of the lips and the motor branch of the seventh that innervates the orbicularis. The reflex is present normally in infants at the breast, but decreases with age

until at four years only one case was found, the child being somewhat abnormal. In 58 adults of both sexes from 14 to 57 years of age it was found only once in an alcoholic. After these observations the author proceeded to examine for the reflex among the insane, examining 100 men and 100 women. He concludes the reflex to be abnormal, and found in more than 50 per cent. of insane. His figures are as follows: Dementia præcox, 58.53 per cent.; senility, 84.21 per cent.; manic-depressive, 32.50 per cent.; phrenasthenia, 66.66 per cent.; epilepsy, 36.84 per cent.

3. *Delirium of Negation*.—A case of melancholia with anxiety and hypochondriacal ideas which came to autopsy. Nothing of special interest for the purposes of an abstract.

WHITE.

Miscellany

CHRONIC PROGRESSIVE CHOREA. F. Lange (Berliner klinische Wochenschrift, Feb. 5, 1906).

At the outset the author refers to a statement of Heilbronner that a study of several generations in chorea families shows a progressive tendency for the disease to appear at earlier ages in succeeding generations. The importance of this idea to the general subject of hereditary predisposition is pointed out, and reference is made to the difficulty met with in finding confirmation or refutation of it in reported cases of hereditary chorea, due to lack of detailed reports. As having some bearing on the matter the author reports a case from the Tübingen clinic. The father of the patient, previously healthy, after a rather severe accident, at forty-eight years of age, gradually developed choreiform movements. At the time of the accident the patient was fifteen years old. He had not learned very well in school and did not develop rapidly. Later, during his military service, he did badly, was much ridiculed, and finally deserted, for which latter he was severely punished. On his return from the army his relatives noticed a marked change in him; his memory was poor and he showed lack of perseverance. His condition gradually grew worse, and he ultimately developed choreiform movements; first in the finger and toes and then in the entire left half of the body.

A thorough physical examination, made by the author when the patient was twenty-six years old, showed little of importance except the presence of choreiform movements and an increase of the tendon, periosteal and plantar reflexes. The typical choreiform movements were pronounced on the left side of the body, but on the right side also isolated movements were present. Certain voluntary acts on the part of the patient increased these movements greatly. When first admitted to the clinic the patient was depressed, but later became cheerful and disposed to entertain others. He recognized his own mental deterioration and was disoriented as to time, but not as to locality. Memory defect was quite marked and he showed a lamentable ignorance of current affairs which his disinclination to read the newspapers partly accounted for. The author is of the opinion that the psychical disturbance attendant on the patient's army service had much to do with his developing chorea. He also believes that the mental condition in chronic progressive chorea constitutes a real dementia and not, as several others have stated, a mere inability of the patient to concentrate his attention. In differential diagnosis the author refers to hereditary predisposition and mental disturbance as cardinal points, but with wise caution says, "Since the establishment of these is difficult we must use good judgment in attributing importance to them."

A. S. HAMILTON (Minneapolis).

Book Reviews

DIE BETRIEBSUNFÄLLE DER TELEPHONISTINNEN. VON PROFESSOR DR. M. BERNHARDT, Berlin, 1906.

This monograph of seventy pages may be of great assistance to the general practitioner, and is not without value for the specialist as a record of the observations and opinions of a trained neurologist. At this time, when every town and nearly every village has its telephone exchange, and every exchange has long-distance connections, such accidents as those covered by Bernhardt's pamphlet, are bound to be no rarity. As electricity is still for most persons a mysterious and fearful force, and as nearly every accident from this force is liable to present medico-legal complications, obviously a proper understanding of such cases is important.

The author has treated over sixty telephone girls who had suffered from accidents incidental to their work in a central office. Some of the patients were seen within a few minutes after the accident, and all were followed for a longer or shorter period.

As to the nature of the "shock" ordinarily received by a girl working at the switchboard with the receiver applied to one ear and held by a head band, the whole tenor of Bernhardt's conclusions is that a considerable discharge of electricity from the instrument to the person of the operator is exceedingly rare. Indeed, he shows pretty conclusively that in very many, if not in most, of the cases, there is no passage whatever of electric current, but only a sudden and violent sound; a purely auditory shock. He does not deny that in certain cases the operator may receive a real electric shock of sufficient intensity to cause a profoundly disagreeable sensation, and even physical symptoms that may seem alarming. But in the most aggravated cases, such as may be caused by a live trolley wire or an arc light wire falling across a telephone wire, he contends that the modern installation of telephone offices prevents any serious physical injury from the current.

In his own cases there certainly was no evidence to show that in any instance the electric discharge had been sufficient to cause even a minimum tissue change. Still, one point in his argument appears weak. In a number of examples cited he states that a minute inspection of the apparatus made immediately after the accident failed to reveal any defect whatsoever, and from this fact he seems to conclude that the shock received by the operator could not have amounted to much, or, indeed, was only a sound. Now, the reviewer claims no special knowledge in this particular matter, but he submits that a current might be transmitted to an operator's ear and head of sufficient strength to cause intense sensory and considerable motor disorder, and yet insufficient to derange the telephone.

The detail of symptoms observed in the author's cases inevitably leads one to his conclusion; namely, that his patients were suffering from functional nervous disorder induced by the accident; that the symptom-complex corresponded to that of the so-called traumatic neuroses, and that this symptom-complex is generally made up of a mixture in various proportions of hysteria, neurasthenia and hypochondria. The results of treatment tended to confirm this diagnosis.

The monograph contains many interesting citations from the literature regarding electrical accidents in general, and especially as regards telephone accidents and the effect of telephones and telephone accidents upon the organs of hearing. In fact, his home bibliography is very full, but few references are given outside of Germany.

The treatment recommended and given in some detail is unimpeachable, but scarcely needs to be repeated, as it is simply that of the traumatic neuroses from accidents other than electric.

H. T. P.

News and Notes

Dr. H. S. Fraenkel, of Heiden, Switzerland, known for his scientific work in neurology, and especially for his compensatory treatment of locomotor ataxia, will visit New York early in November. It is Dr. Fraenkel's desire to demonstrate how much can be accomplished in the most severe cases by his treatment, and at the same time, while showing its limitations, to sound a warning note in reference to the dangers which a misapprehension of his method carries with it. He intends remaining several months in the United States, and has promised to read papers before the New York Neurological Society, the County Medical Society and the German Medical Society.

THE
Journal
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Original Articles

THE RELATION OF SCHOOL WORK TO THE MENTAL
FATIGUE OF CHILDREN.*

BY B. SACHS, M.D.,

OF NEW YORK.

When the President of this association suggested that he was anxious to have a discussion on some subject of general interest to the public and to medical men, it occurred to me that it might be well to have a word to say regarding the influence of school work upon the nervous disorders of childhood. The question is one that has been ventilated freely enough, and among the laity, at least, the opinion seems to prevail that in some mysterious way the school is responsible for mental fatigue in children as well as for the development of many of the neuroses of early life.

The pedantic application of psychologic and pseudo-psychologic methods to the study of the mental development of children has become the fad of the day. Popular magazines print articles with the evident purpose of stirring up the public and of showing what a baneful influence the school exercises. The cry is raised that we are overtaxing the child, are cramming him full of knowledge, to the detriment of his God-given qualities, are retarding his intellectual development instead of furthering it, and are making pitiable creatures of what might otherwise have been the very pride of creation. One author would have children treated as are the most tender plants; not an idea is to be put into their heads before the age of ten, and, according to many other writers, children must be toyed with rather than instructed. And all these demands are made, and all this hue and cry are raised on the

*Read at the meeting of the American Neurological Association, June 4 and 5, 1906.

supposition that the school is overdoing the matter of education, and that the child is being deprived of a wholesome development.

Let the public at large, and parents in particular, not forget that even while the older educational methods were in vogue, comparatively little harm was done, and that in former years there seemed to be less difficulty in the way of developing sane minds and of raising children to whom a little knowledge was no burden, and who seemed to grow up into robust manhood and womanhood none the worse for the tasks that had been imposed upon them in earlier years. It is well that some authoritative statement should come from the members of this association, to whom, collectively, a large number of children would have been brought exhibiting the baneful effects of school work if such injury had in reality been wrought. I leave it to you to agree with or to combat the conclusions which I have reached, based upon an experience of twenty-one years and upon thousands of cases of nervous disease in hospital and in private practice. I have not seen a single instance of serious injury done to the child's mental development by any influence which the school as such could have exerted. I refer not only to children who attend private schools, but quite as much to those who are educated in the larger public institutions.

The clinical symptoms of neurasthenia, the very form of nervous disorder which we should expect if the school were directly responsible for mental fatigue, are rarely encountered in children.¹ The lack of concentration, the headache which comes from an attempt to apply one's self to a given task, the feeling of restlessness and of depression, the pain on the top of the head and the drawing sensations in the back of the neck,—all these symptoms so characteristic of the adult neurasthenia are not met with in the young; and the physical symptoms, the tremor of the hands and the lids, the exaggeration of the deep reflexes, these, too, in association with one another, are rare in the earlier years of life.

Nor is it astonishing that the physician should encounter these disorders so rarely if we bear in mind the very marked improvement which has taken place in the modern school methods, when we consider how easy the acquisition of knowledge is made

¹So rarely, indeed, that the subject is not even discussed in text-books on the nervous disorders of children.

early in life, how the child's perceptions and reasoning powers are awakened without subjecting the child to any strain, and if we compare these modern methods with the older ones in which everything was made dependent upon memory alone, and in which the perceptive and reasoning faculties of the child were not properly developed and respected. I have made it a point to confer with a number of teachers and educators, and have asked them whether they have noticed the easy mental fatigue of children, and whether they could understand the opposition to school work which seems to be widespread and unwarranted. The prevalent opinion among those best able to judge is that no such strain is noticeable among the normal pupils of a school. Every effort is made by the best teachers of the day to provide against unusual fatigue, the subjects of each day are divided in such a way that the attention of a child is not riveted for too long a time upon any one subject. The subjects are frequently changed, thereby securing a wholesome variety in mental application; and in this country, at least, possibly by contrast with the older methods prevalent in some of the countries of Europe, greater physical freedom is permitted in the school room, so that there is less danger also of physical fatigue than there is abroad. If we consider, furthermore, that in the arrangements of the school programmes allowance is made in the succession of studies for the fact that the mind is naturally a little keener and fresher in the earlier than in the later hours of the day, and that the easier and more difficult subjects are arranged in such a fashion as to lighten the task as much as possible for the child; if we consider these facts and many more which the pedagogue would be much better fitted to dilate upon than I am, we cannot, with a clear conscience, charge the school or the teacher with any responsibility for the production of mental fatigue, if such exists.

Mental fatigue is to my mind no more of a morbid symptom than physical fatigue is, provided it be transitory and be recovered from promptly after a short period of relaxation. Just as physical fatigue follows upon physical exercise, so mental fatigue may follow upon exercise of the ordinary faculties, and the latter is quite as innocuous as is the former. That a child should feel tired after a few hours of school work, that it should feel at the end of a school session that it must have a few hours of play before it can engage in any serious mental occupation is quite

as natural and normal as that a child after hours of play should feel physically tired and in need of rest before it can continue its games. It is worth noting that one psychologist who has made satisfactory tests of the perceptive qualities of the child during school hours, finds that the child's mind is just as active in the afternoon as in the early morning hours. While I am not willing to accept any one series of tests as conclusive, this special experience goes to prove that there is not very much foundation for the general outcry against the present-day school methods.

It would be natural for the public, or for you, to ask whether we medical men, and neurologists in particular, have not insisted many a time in the course of years that pupils be withdrawn from school and whether we have not seen neuroses of various kinds develop in school children. To this an affirmative answer may be given with absolute frankness. Not infrequently have I insisted that a child be withdrawn from school because its general nervous temperament was such that the influence of the school room was not a wholesome one for it and that the presence of such a child was certain to exercise a baneful influence upon others. *The child was unfit for school, but the school did not unfit it.* If a pupil in attendance at a school develops St. Vitus' dance, the pupil must naturally be withdrawn both for his own sake and for the sake of others; but such a child has the tendency to chorea and the school cannot be held to account for the development of the disease, and, as a matter of fact, in the vast majority of instances if any one factor were to be held to account for the development of St. Vitus' dance in those predisposed, it would be the methods of play rather than the methods of work.

Many a time, too, I have advised that a child be withdrawn from school because the strain of work and the rivalry with others was too great for its mental make-up. But such deficiencies are inherent in the child itself and are not to be laid at the door of school methods. There is nothing more difficult to convey to the mind of the parent than the fact that the child is not up to the standard of other children and cannot be expected to vie with them. In the interest of our entire population, in the interest of the vast majority of children, we must insist that school methods be adapted to the normal child and not to the child that is mentally or physically deficient. It is the determination of parents rather than of teachers to keep the defective children, the mental

weaklings, abreast of the healthy average child that is responsible for much of the mischief that is done, and it is only within recent years that the governing bodies in our larger cities have felt the responsibility of educating the moderately defective child apart from the others, thus doing away with the unjust rivalries and with the injustice of expecting all children to come up to a single standard of attainment. If you call such schools, "schools for the training of defective children," omitting altogether the terms "weak-minded," "imbecile" and "idiotic," you will encounter the opposition of the proud parent who can see no blemish in its offspring. If you use some more euphemistic term, speaking of them as "training schools," or if you will use any term that carries no slur with it, you will find that great good will be accomplished in every community by the establishment of such schools. I trust that every member of this association will contribute his influence in his own community for the establishment of such institutions. It is one of the crying needs of the day.

Granting that the question of mental fatigue in children has been given undue importance, what are the conditions which give rise to the functional neuroses of childhood? Among the causes responsible for this are the restless spirit of the American home, the examples set by the parents that everything must be done, not well nor even half well, but at least hurriedly. The social ambition that pervades the home, that allows less consideration to be given to the study of the child by the parent, than to the impressions made upon one's neighbors,—these are the forces that work for evil. Children are forced early in life to be up and doing in order to get into, and to remain in, the social swim. The inordinate pursuit of athletic sports, with its intense rivalries, the dances, the frequent visits to theaters,—all these are responsible for the nervous affections of the young and for such mental fatigue as exists in children. It is the school alone which in our American life exerts that slight restraining and quieting influence which our children need above all else.

A DEFINITE CLINICAL VARIETY OF CEREBRAL ARTERIO-SCLEROSIS.*

BY JOSEPH COLLINS, M.D.,

Sclerosis of the blood-vessels of the brain is sometimes to be found on autopsical examination of individuals who, during life, showed no evidence of the disorder in the skeletal blood-vessels. It occurs as an incident in some organic diseases of the brain, particularly softening and general paresis. It occurs as a sole pathological condition which naturally, if it lasts long enough, will be followed by manifestations of disorder of projection tracts like the motor. When cerebral arteriosclerosis occurs as a primary condition, it causes a pathognomonic clinical picture, upon the existence of which alone the diagnosis is justifiable. It is to the consideration of this clinical picture that I invite your attention.

The symptoms that accompany it are fairly constant, and the clinical picture is not subject to much variation. The subjective symptoms are, indeed, very few, and it is with difficulty oftentimes that they are elicited. The patient complains of fugitive headache, often referred to the occipital region; of slight giddiness often coupled with a sensation of insecurity of station and gait which, however, is not attributed to the giddiness; and of impaired snap or vitality. The headache is usually dull in character, and of variable severity. In some cases it is a conspicuous feature; in others it is not. Not very often is it of the intense agonizing character which is fairly characteristic of arterial hypertonus, such as that occasionally occurring with mitral stenosis and aortic insufficiency. These symptoms may exist for several months, or even years, before other and more striking symptoms call professional attention to the patient. The emotional symptoms, which occasionally are early manifestations, are attacks of meaningless laughter, less often of crying, which do not occur in the spasmodic that is sometimes seen in disseminated sclerosis or in ancient apoplexies, but which are like them without attributable cause and without emotional concomitant. The latter is an important feature; the patient does not feel like laughing or like crying.

*Read at the meeting of the American Neurological Association, June 4 and 5, 1906.

The most striking feature of the disease, however is the patient's appearance. The individual becomes transformed from

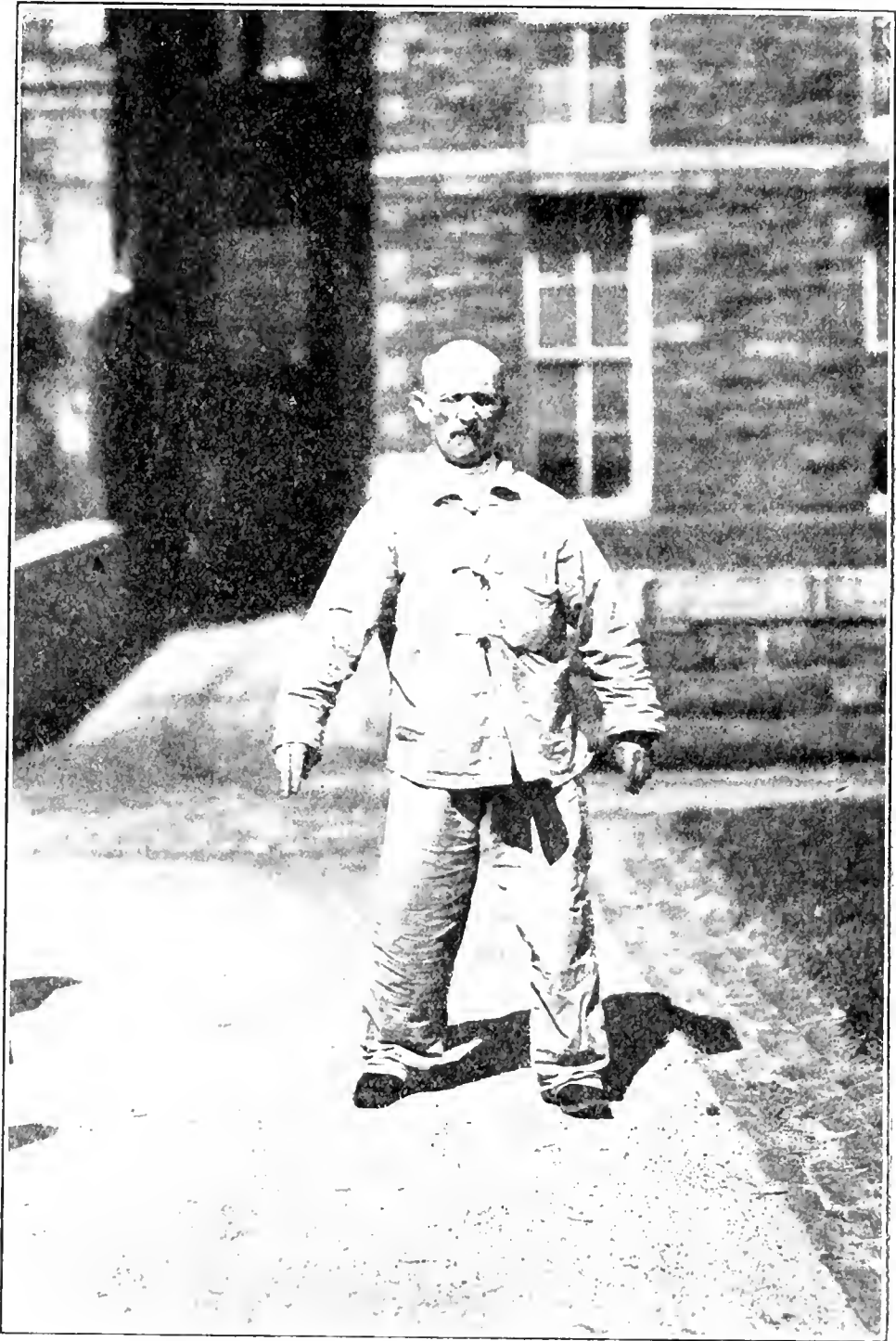


FIG. I.

a person expressing grace in movement and relaxation in repose, into an immobile, inanimate replica of the normal person. The

immobilization gives a characteristic attitude and gait, and to a lesser degree, a characteristic physiognomy. The gait is, perhaps, the most remarkable feature of the patient. The stride is short, oftentimes only a few inches, the feet widely separated and not lifted far from the ground, the rhythm of the movement often slow, but sometimes rapid. When the patient turns, he often thrusts out the hands as if to seek support, though he rarely falls. In some instances, perhaps in all, the patient can run better than walk. It is very difficult to show these in a photograph, but in a measure Fig. 1 depicts them. Mental symptoms may or may not exist. In the majority of cases they are not conspicuous, consisting merely of some depression, indifference and apathy. When the disease is far advanced, mental symptoms are more common. At first sight the clinical picture reminds one of Parkinson's disease, but on close observation they have only one feature, immobilization, in common. There are no vasomotor symptoms and secretory symptoms, no marked alteration in the pitch of the voice, no characteristic tremor, no festination, or other striking feature of the latter disease.

The objective symptoms, aside from those that have been enumerated, are few and inconsequential. The knee-jerks are usually lively, and in some cases that have lasted a long time the big toe phenomenon of Babinski is present, indicating secondary degeneration in the pyramidal tracts of the spinal cord, but it is not an essential clinical feature, nor is disturbance of the sphincters, which I have seen in one or two instances. In some cases there is evidence of sclerosis of the skeletal and visceral arteries, but in others, perhaps the majority, there is slight involvement of them. Indeed, the blood-pressure, as revealed by the sphygmomanometer may be low, 110-130 (S) and the heart sounds devoid of particular change. The disease is essentially chronic and subject to little variation, save in the amount of headache, giddiness, and apparent emotional manifestation, which are variable. One of the most remarkable features of the disease is the occasional complete absence of visceral and skeletal arteriosclerosis. In such cases the diagnosis would be difficult because of the absence of increased blood-pressure, of palpable thickening of the peripheral blood-vessels, and of alteration of the heart sounds, were it not for the fact that the clinical picture which it produces is quite pathognomonic.

In private practice, patients thus afflicted are often looked upon as hysterical or neurasthenic individuals, while in hos-

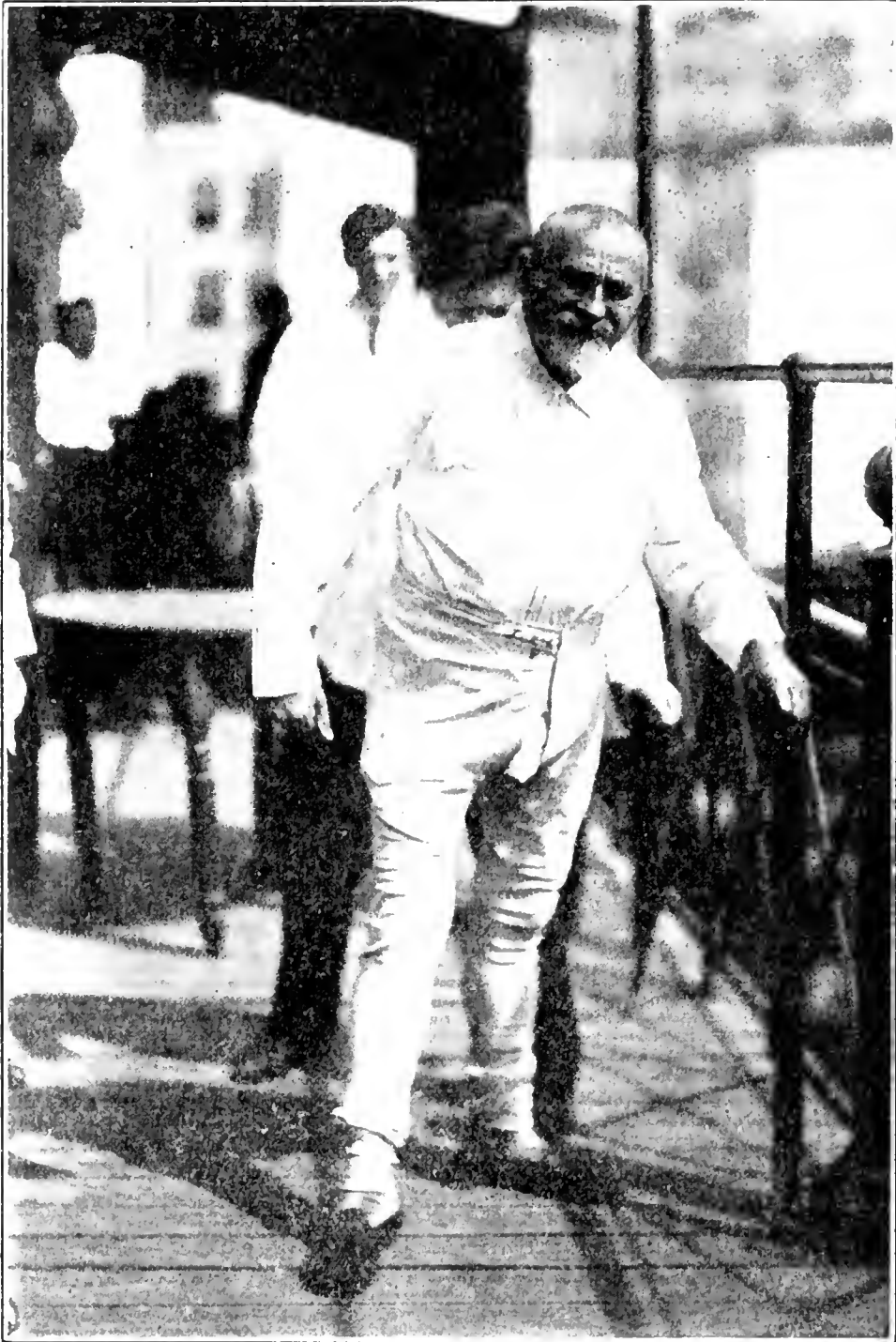


FIG. 2.

pitals, especially those given over largely to patients suffering from chronic disease, they go to swell that considerable number that are neither studied nor diagnosticated.

The paucity of subjective symptoms and the striking objective symptoms are illustrated by the following history: The patient, a Russian peddler 48 years old, who denies syphilis and alcoholism, noted about six months before he came into the hospital that he was becoming unsteady when he walked and that he often had a sensation of dizziness. At times he had some headache and a buzzing sensation in the head. Further than this there was no complaint. The most remarkable symptoms were his appearance and his gait. The inanimate, wooden transformation was expressed in features and in limbs. When he attempted to walk, the feet, wide apart, shuffled along the floor a few inches at each stride, the strides sometimes fast, sometimes slow, while he made balancing movements with the hands. The only objective symptoms, aside from these apparent to the eye, were those of mild arterial sclerosis. The blood-pressure was 165 (Stanton); the vessel walls were palpable, but there is no hypertrophy of the heart. He has been under observation for a year and very little change has taken place in him during that time, save that the arterial hypertonus has disappeared, as it does in the majority of the cases of arterial sclerosis subjected to hospitalization and iodide of potassium.

Another most typical case of this variety of cerebral arteriosclerosis is the following: The patient, 48 years old, a peddler, whose wife had fifteen children and two miscarriages, began to complain when he was 44 years old of indefinite pains in the legs and of a heaviness in the lower extremities, particularly on going upstairs. About this time his wife noticed that his speech became altered, but she was unable to describe the alteration very lucidly, save to say that it was difficult to understand it. In addition to this, she noticed that he laughed constantly. After these symptoms had lasted for some time, he fell one day as if paralyzed. He did not lose consciousness, but he was paralyzed, —on which side neither he nor his wife knows. This hemiplegia gradually disappeared, and when he got up and began to go about, the peculiar alteration of station and gait which he now has, became evident. The accompanying photograph will give some idea of the station and gait. He stands with the entire body bent forward as if he were a pillar about to topple over. There is no evidence of paralysis. His face is spastic, and he constantly breaks into laughter. When he attempts to walk,

he must hold on to some one; the stride is about two inches, the feet wide apart, shuffle; there is no staggering. After walking about for a while, he gets tired and exhausted.

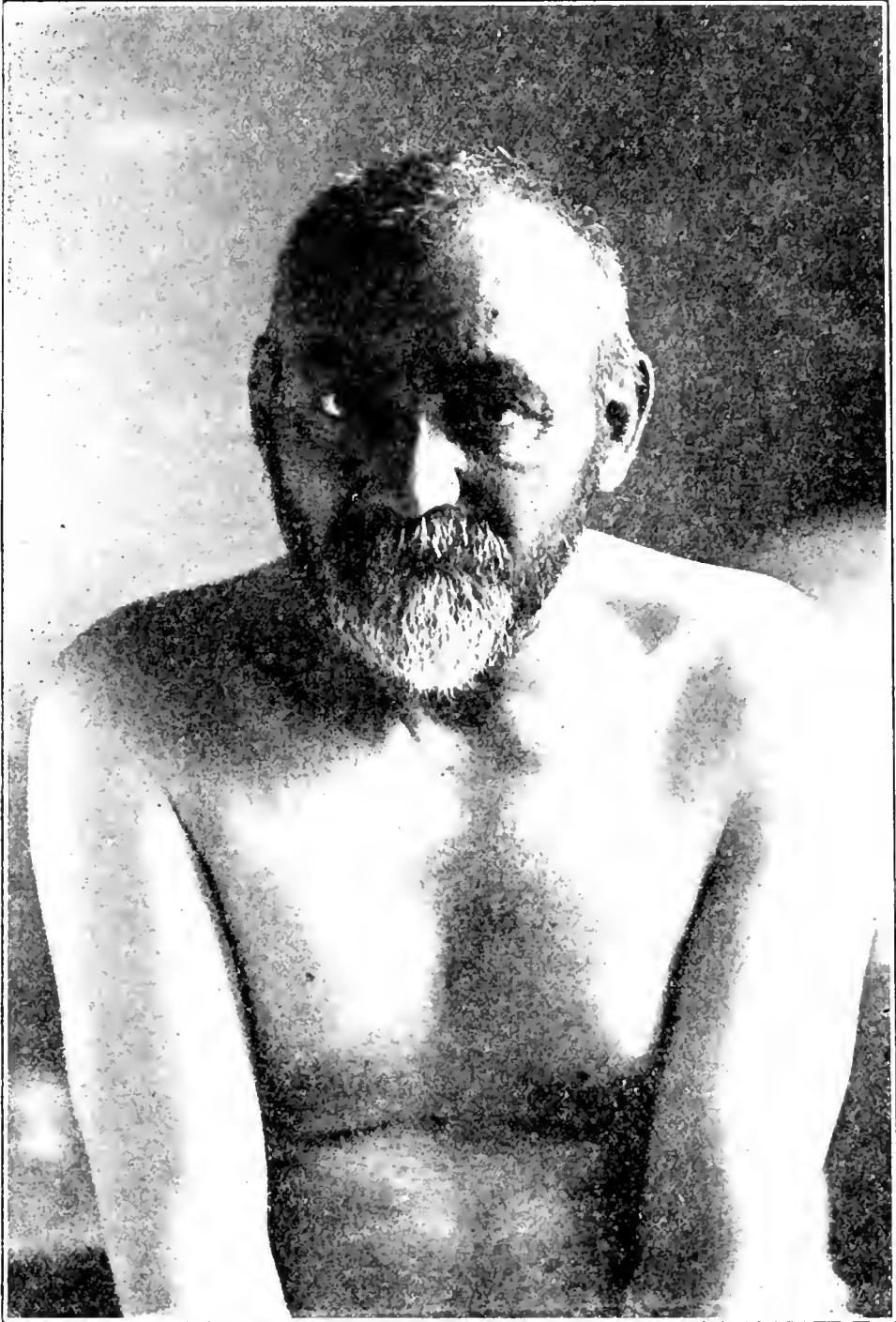


FIG. 3.

Examination shows, in addition to this remarkable immobility which has been mentioned, no particular physical signs save

those of the profound arteriosclerosis. There is no evidence of hemiplegia, unless a slight drop of the right angle of the mouth may be so considered. The tendon jerks are not markedly exaggerated. There is no Babinski sign. The superficial reflexes are absent. The speech shows profound dysarthria. He mumbles his words and speaks without particular intonation. There is no difficulty in swallowing, no drooling. It is difficult to estimate his mentality, but he is fully oriented, looks after himself in a normal way, manifests evidences of pleasure when his family visit him, and in a general way comports himself like an individual in possession of his faculties, but whether or not his memory is seriously impaired cannot be said. The condition in which he is now has remained without particular alteration for upward of three years. The manifestations of arteriosclerosis are fairly well marked, but not profound. The blood-pressure is various, from 150-180 (S.) and the radials, temporals, and other palpable arteries are thickened and resistant. The heart is but slightly hypertrophied, and save for a very common accentuation of the second sound, shows no abnormality. Repeated examinations of the urine shows no albumin or casts save an occasional hyaline cast. Hemoglobin averages 85%, red blood cells 4,000,000, white blood cells 10,000 to 12,000.

These two citations are sufficient, I think, to show the general features of the cases. I am inclined to believe that this variety of arteriosclerosis of the brain will be found to be not extremely uncommon. I have notes of fifteen cases with five autopsies out of a total of 135 cases of cerebral arteriosclerosis. The wonder is that they have not had more attention paid them. In the literature one constantly sees them mentioned to illustrate other points in neuropathology. An excellent example of the disease was presented to the Philadelphia Neurological Society, Nov. 22nd, 1904, by Dr. W. C. Pickett.¹ "A man 65 years old began to have headache and dizziness and became stiff all over, and to have difficulty in walking; mumbling speech and no impairment of mind." Recently Farquhar Buzzard and Stanly Barnes² have reported a case of "Chronic Progressive Double Hemiplegia," which is identical with the disease that I am endeavoring here to portray, and which I consider to be a most im-

¹JOURN. OF NERV. AND MENT. DIS., 1905, p. 182.

²Review of Neurology and Psychiatry, 1905, p. 182.

portant and opportune contribution to the recognition and proper interpretation of it. A woman of 43 experienced a trivial fall from which, however, she dated her symptoms, which were attacks of uncontrollable laughter, weakness of the legs and alteration of speech. Ten years later she came under the reporters' observation, her symptoms being then the same as before. "The face was noticeable for some loss of the natural expression. All the facial movements were awkward and slow. Frequent attacks of spasmodic, meaningless laughter. In standing, the back was bowed a little, the head thrown forward. The arms were at the sides, the elbows and hands in partial flexion. She shuffled with small steps, the feet being dragged along sometimes scraping the floor. The knees were bent in walking, but not so much as usual. The whole gait had an aspect of stiffness, and although there was no tremor or propulsion, yet *with her almost expressionless face one was forcibly reminded of paralysis agitans in an early stage.*" Nowhere was any movement completely lost, nor could any difference at any time be made out between the two sides. The tendon-jerks were lively, but not greater than is frequently seen in neurasthenia. The plantar reflexes showed the condition which F. Buzzard has called "pyramidal equilibrium." That is to say, when the plantar jerk was tested with the limb in the general flexed position, the plantar response was invariably flexor, but when tested with the leg and thigh in the extended position, the plantar response was invariably extensor at first, but flexor if the stimulus was repeated. There were no trophic or sensory disturbances. The pulse-rate was 86, medium tension (no sphygmomanometric measurements apparently), no thickening of the vessel wall. The heart and kidneys were apparently normal. She died without warning while eating breakfast. The case apparently had long been considered one of hysteria, but the reporters excluded that chiefly because of the condition of "pyramidal equilibrium" mentioned above, and concluded that the diagnosis was a degeneration occurring in the upper motor neurones, and probably not affecting any other of the main neuronic systems of the central nervous system.

Naked eye and microscopical examination showed most extensive and intense cerebral arteriosclerosis. No gross lesion, such as growth, softening or hemorrhage, was found after hardening in formalin. The large majority of the arteries, even the

smallest, were conspicuous from the rigidity of their walls, and the branches of the perforating arteries on account of a small patch of discoloration which was often present in the tissue surrounding them.

The writers say that "It is remarkable that no sign of the presence of arteriosclerosis could be detected in palpable systemic arteries or in the heart." As I have said in this paper, and frequently elsewhere, this is not uncommon. The writers append a paragraph entitled nomenclature to their article, and favor somewhat, it would appear, the term primary lateral sclerosis, although fully recognizing the inadequacy of such designation. But I venture to suggest, not in a spirit of criticism, that the term chronic progressive double hemiplegia is no more appropriate. Why not call it cerebral arteriosclerosis? That is what it was, and my experience would seem to entitle me to say that in many instances cerebral arteriosclerosis portrays itself in every feature, as shown by the patient of Buzzard and Barnes, and that the picture is absolutely pathognomonic from which the diagnosis can be made even in the absence of every manifestation of general arteriosclerosis.

The gait of these patients, as I have previously said, is one of the most striking features. Naturally this has not escaped the observation of our predecessors. Charcot³ described an *abasia trepidant* of the senile, which is not unlike that to which I call attention, if it is not the same thing. Certain it is that the gait of patients with arteriosclerosis, described by the Polish physician, Bieganski,⁴ is the condition to which we refer. An article by Petré,⁵ entitled "*Ueber den Zusammenhang zwischen anatomisch bedingter und functioneller Gangstörung in Greisenalter,*" gives an excellent full description of it.

After death, which in some instances comes suddenly from successive attacks of syncope, from intracerebral, intracerebellar, and intraventricular hemorrhage, and from intercurrent trifling disease, such as influenza, acute indigestion, etc., very striking changes are found in the brain.

I have been accustomed to compare the condition to the contracted kidney of arteriosclerosis. Whether there must be a definite localization of the arteriosclerosis to produce this symp-

³Leçons du Mardi, 1888-1899, pp. 335, 469.

⁴Medryna, xiii., 1893.

⁵Archiv für Psychiatrie, xxxiii., xxxiv.

tom-complex, I am not in a position to state. In the cases that I have with autopsies, the involvement of the vessels has, in the majority of instances, been extensive.

In some instances the entire brain is shrunken; in others it has a normal appearance. The vessels show the essential lesion which varies in distribution, in character, in intensity and in extent. Sometimes, though not always, the vessels at the base of the brain are atheromatous, hard, and gaping when cut across, but in other instances the arteriosclerosis is not apparent until the brain is opened. Then the most striking alterations usually are to be seen in the middle cerebral arteries and their branches.

If death has been immediately conditioned by an accident such as rupture of a blood vessel, naturally the results of this will be found. The alteration of the brain substance depends upon the duration and intensity of the process in the blood vessels, and a detailed description of these to cover every case cannot be given here. In some instances there will be found secondary changes of the nature of Wallerian degeneration in the spinal cord, when the motor tracts of the brain, especially the subcortical motor tracts, are encroached upon.

For instance, a summary of the protocol of the autopsy of the last case that I had may be taken as an example:

1. Small brain.
2. Veins congested.
3. Arteries stand out as thick, cord like structures.
4. Markings typical, but not symmetrical.
5. All the arteries, particularly those of the base, show a very extreme degree of thickening with calcification and fatty degeneration.
6. Areas of nodular dilatation, i. e., aneurysms, practically on all the trunks.
7. Left vertebral artery 1.5 cm. from its origin at the basillar is plugged by a thrombus of very recent origin.
8. The branches of both internal carotids anterior to the circle are much diminished by the thickened walls.
9. Cortical thickness extremely irregular.
10. Macroscopical branches of arteries appear obvious, due to great thickening of walls.
11. Small vessels of pons have a distinct gaping appearance.
12. There is no apparent difference in the degree of arterial change in any portion of the brain.

THE VISION FIELDS IN CASES OF INDIRECT OR INCOMPLETE LESIONS OF THE OPTIC SYSTEM.

BY COLIN K. RUSSEL, B.A., M.D.,

OF MONTREAL,

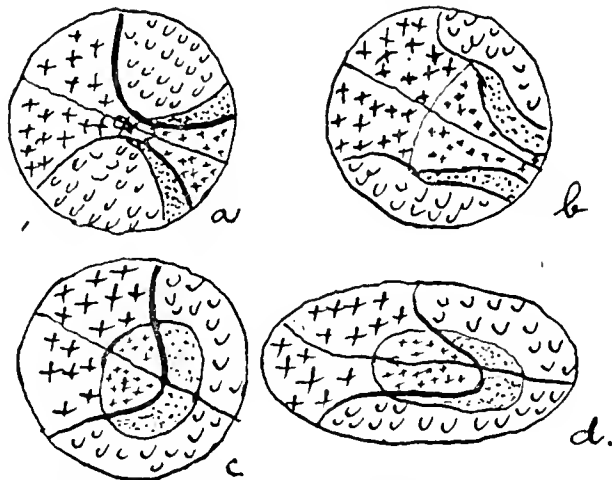
FORMER HOUSE PHYSICIAN, NATIONAL HOSPITAL FOR PARALYSED AND EPILEPTIC, QUEEN SQUARE, LONDON, ENG.; CLINICAL ASSISTANT IN MEDICINE AND NEUROLOGY, ROYAL VICTORIA HOSPITAL, MONTREAL, CAN.

It is a well recognized fact that where intracranial tumors exist causing impairment or loss in the fields of vision, that there is considerable variation according to the site of the lesion and the part of the optic system interfered with. This can be readily seen from the anatomical relations, more especially of the macular fibers, which, in this connection, are of prime importance. In the optic nerve these macular fibers are collected into a circumscribed bundle¹, situated more or less centrally. The fibers of this macular bundle, which later decussate, lie in a wedge-shaped area on the temporal side of the nerve and slightly ventral, while those which are uncrossed lie dorsal and ventral to them. Approaching the chiasma the crossing fibers become gradually still more central, while the uncrossing fibers lie to their temporal side [vide Fig. I.].

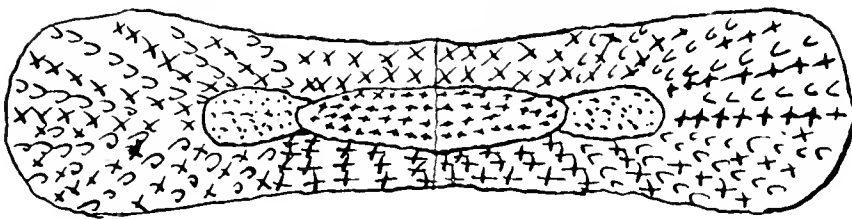
Going still more backwards one sees that in the chiasma itself there is a certain amount of rearrangement, but the macular bundles still maintain their individuality and are found to retain their central position. Opinions differ as to whether the uncrossed macular fibers form an individual bundle in the tract, or intermingle with the crossed bundles. Henschen, and the majority of other observers, find that the uncrossed bundle lies above and to the temporal side of the crossed bundle, and maintains this position till it enters into the external geniculate body. Here it breaks up into numerous smaller bundles.

The pulvinar and the anterior corpora quadrigemina hold a very much less important position with regard to vision, in man, than they do in the lower animals, and cases have been reported in which destruction of one or both of these ganglia have caused

no hemianopia.¹ So that the external geniculate body is by far the most important, if not the only primary center of vision. Flechsig has shown that in the newborn the fibers from the geniculate body are the only ones in the optic radiations which have their myelin sheath. The arrangement of cells and their relation



Right Optic Nerve. (Diagrammatic.)



e. Diagram of Chiasma.

Fig. 1.

++ Crossed peripheral fibers. ::: Direct macular fibers.
 ++ Crossed macular fibers. u u Direct peripheral fibers
 Temporal side to right.
 Nasal side to left.

- a. Nerve at exit from optic globe.
- b. Nerve. More central section.
- c. Nerve section of intraorbital portion.
- d. Nerve. Intermediate section anterior to chiasma (from Henschen).

to the visual fields in this ganglion is obscure. It is possible, as suggested by Henschen from a study of two cases with lesions

¹Sinkler: *Neur. Centralblat*, 1893, p. 300; "Tumor of the Thalamus without Hemianopia." Eisenlohr: *Ibid.* 1892, p. 149; "Destruction of the Pulvinar on Both Sides Without Loss of Vision." He says vision was not appreciably affected. Henschen: "Path. des Gehirns." Vol. III, 8th case and 17th; hemorrhage into the pulvinar; vision normal. Miura of Tokio (quoted by Henschen in "Le centre cortical de la vision"); Thalamus and anterior corpora quadrigemina involved in gliomatous neoplasm, with only a little irregular concentric limitation of vision fields. Eisenlohr: Quoted by Henschen in "La centre de la vision;" Bullet wound causing destruction of anterior corpora quadrigemina, with no loss of vision, merely inactive pupil. von Monakow: Similar case.

affecting the dorsal part of these bodies, that the cells in the dorsal part are in relation to the inferior portion of the visual field.

The same author, and von Monakow also, has described in cases of atrophy of one optic nerve, crossed and uncrossed fibers going to one part of this ganglion. This would suggest that the corresponding parts of the two retinae are connected with the same part of the geniculate body.

The question of the extent of cortical representation of the retina in the occipital lobe is hard to answer. If we consider the blood supply of the part we shall see the difficulty. The posterior cerebral artery, a branch of the basilar, supplies the medial surface of the occipital lobe, giving off three branches: (a) To the parieto-occipital fissure; (b) to the calcarine fissure, and (c) to the cuneus. The branch to the calcarine fissure sends in a branch to the optic radiations so that any lesion interfering directly or indirectly with the blood supply affects not only the cortex but the optic radiations as well.

Ferrier, who has done much in the study of cerebral localization of physiological functions, in the first place started experimentors on the wrong track,—just as Charcot led the clinicians astray. He placed the center of vision in the angular gyrus. Later, with Yeo, he extended this to the occipital lobe. Munk established it definitely in the occipital lobe, and von Monakow by means of the method of consecutive degeneration, placed the center of vision in the territory of the calcarine fissure and the two adjacent convolutions (cuneus and lingual); and later extended it on the external surface as far as the angular gyrus. Henschen limits it to the calcarine fissure. Campbell, from his recent histological investigations, is convinced that two definite and distinct areas can be mapped out in the occipital lobe, and that these two fields have different physiological functions to perform—the one specialized for the primary reception of visual sensations, the other constituted for the final elaboration and interpretation of these sensations. The first he terms, “the visuo-sensory center” and locates it in both lips of the calcarine fissure. The other field, which he has named the “visuo-psychic center,” invests this and extends from the parieto-occipital fissure on the medial surface, including the whole

cuneus and posterior part of the lingual and fusiform cortex, and extends on the external surface of the occipital lobe as far forward as the Ramus Occipitalis Transversus (the homologue of the "Affen Spalte").

Henschen² has suggested, from clinical and microscopical re-

Fig. 2.

Fig. 2. Fields for white showing central scotoma.

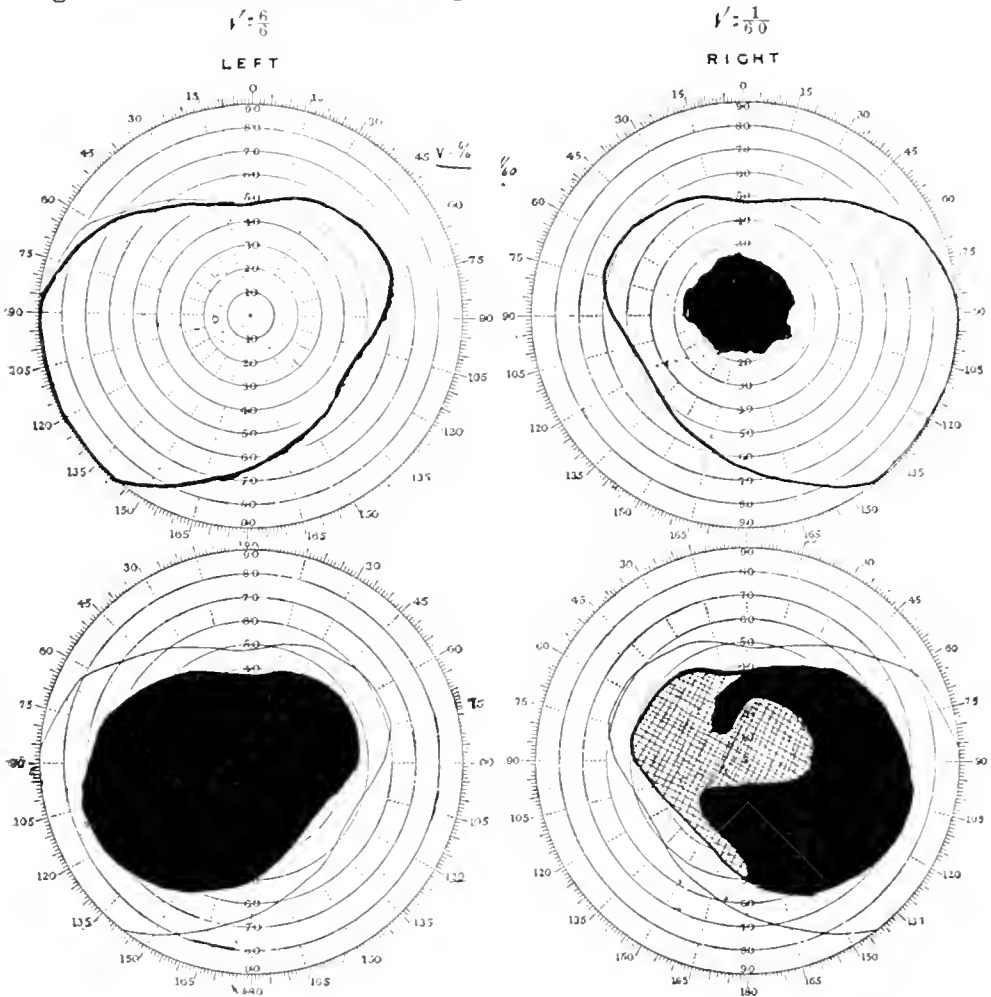


Fig. 2A.

Fig. 2A. Fields for red, showing scotoma central and to nasal side. Test objects used measure 1.0 cm. square.

Acuity of vision, left = $\frac{6}{60}$ Right = $\frac{1}{60}$

search that those fibers which end in the upper lip of the calcarine fissure stand in relation to the upper homonymous quadrants of the retinae, and those to the lower lip of the fissure correspond to the lower homonymous quadrants. In the optic radiations the same thing holds good, as I think Beavor and Col-

²"Projection de la retina pour la corticaleté calcarine," Paris, '03, p. 12.

lier's³ case shows, in which with quadrantic hemianopia in the left upper *fields* there was degeneration in the ventral part of the right radiations, i. e., that the upper part of the radiations corresponds to the upper part of the retinae.

These anatomical relations bear a most important relation to clinical facts, more especially as regards cerebral localization. With incomplete or indirect lesions of the optic system the *fields* and the acuity of vision vary very materially, according as the

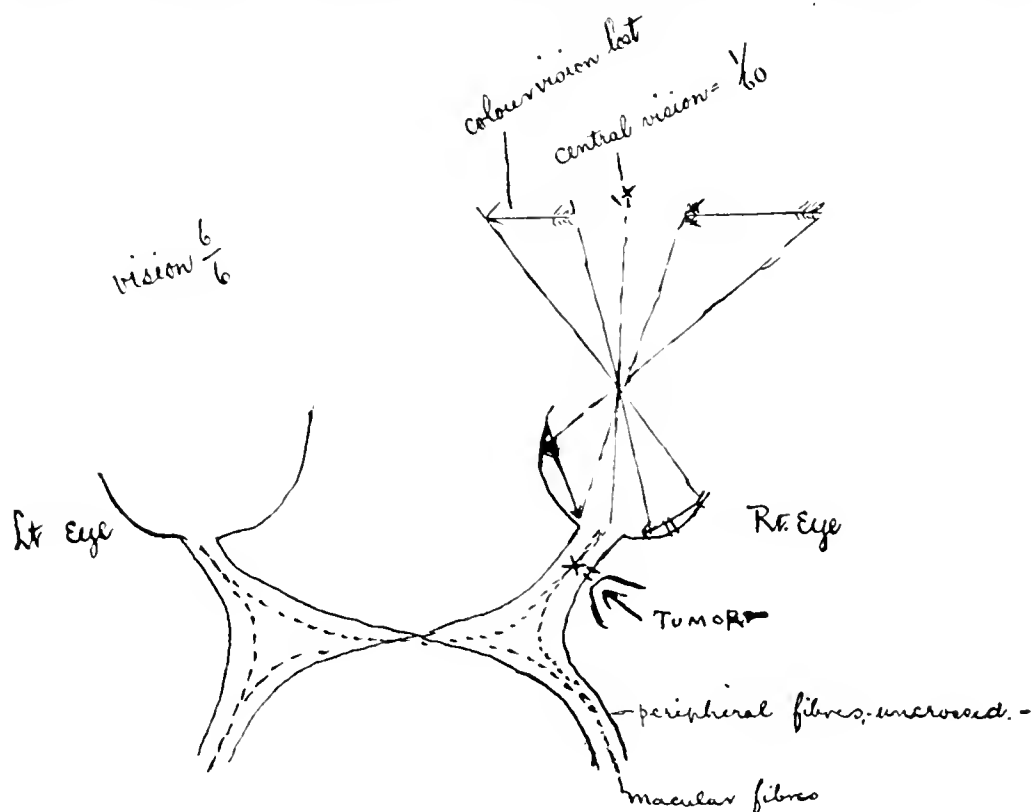


Fig. 2B.

lesion affects the optic nerve, the tract, or the radiations. The reason for this variation is obvious and depends on the *position* of the macular fibers,—subserving, as they do, the higher physiological function of central vision, they are more highly developed; added to this, their more delicate histological structure and their position in the optic nerve and tract, *indirect or incomplete lesion of these parts gives rise to impairment in acuity or loss of central vision, while lesions posterior to this where the macular fibres are no longer grouped together, but form rather a physiological projection, cause a quadrantic or a hemianopic loss with less impairment in acuity of central vision.*

³Brain, Summer, 1904, p. 153.

CASE I. *Optic Nerve Lesion; direct or indirect pressure.*

A. F., male, aged 36, clerk, was admitted March 29th, 1905, to the National Hospital under Sir William Gowers, complaining of headache, fits, and mental change. For five years the sight in the right eye had gradually been getting bad, and for nine months he had suffered from headache, left-sided fits, and some mental deterioration.

On examination, smell was lost in the right nostril and normal in the left. The vision was, R.=1-60th, L.=6-6. *Optic discs*=R., margins clear cut with considerable atrophic cupping. The lamina cribrosa was visible over a large area; the inner margin of the disc was opaque dirty gray; veins of good size, arteries small.

L. Normal.

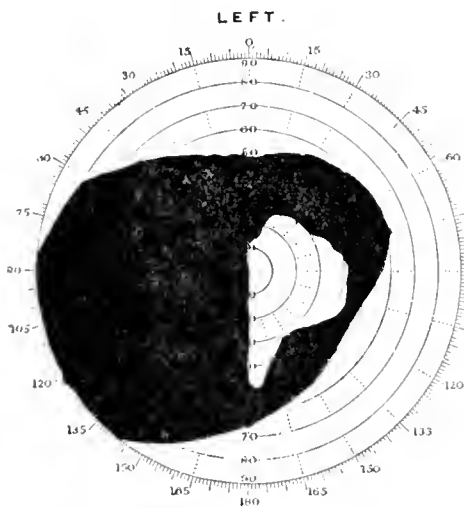


Fig. 3A.

Acuity of vision= $\frac{6}{30}$

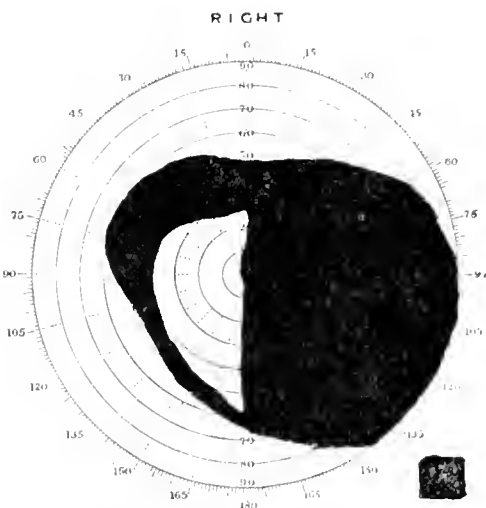


Fig. 3B.

Macular vision=nil.

Pupils: R. Dilated slightly compared to left; L. reacted well. R. poorly and dilated again quickly.

The *vision fields*, Fig. 2, shows the left to be normal, while in the right there is a central scotoma for white. To red and green the scotoma extended into the nasal part of the field as well—Fig. 2A.

Taken in conjunction with the right-sided anosmia and the other symptoms, the defect in the right field division makes it more than probable that there was a tumor in the posterior part of the anterior fossa causing pressure on the optic nerve from the temporal side—the macular fibers, although more central, suffer first on account of their more highly organized structure—shown by the central scotoma for white. Color vision being a later acquisition and a higher physiological function, is still more easily damaged and its paths even outside the macular bundle on the temporal side of the nerve, in the direct line of pressure,

are interfered with causing the loss of color vision to extend into the nasal field as well—(vide Fig. 2B).

CASES 2 and 3. *Chiasmal Lesions*. In these cases one finds in the *visual fields*: (1) Very little escape round the fixation point (vide Fig. 3A); or (2) overspread of fixation points (vide Fig. 3B); or (3) blindness in one eye. In Case 2, I was also able to ascertain from Dr. Atley, who attended this patient, that six months prior to his admission to the hospital he had definite bitemporal hemianopia for red, more marked in the right field than in the left, while the fields for white were practically unimpaired.

CASE 2. A. C., male, aged 26, caterer, was admitted to the

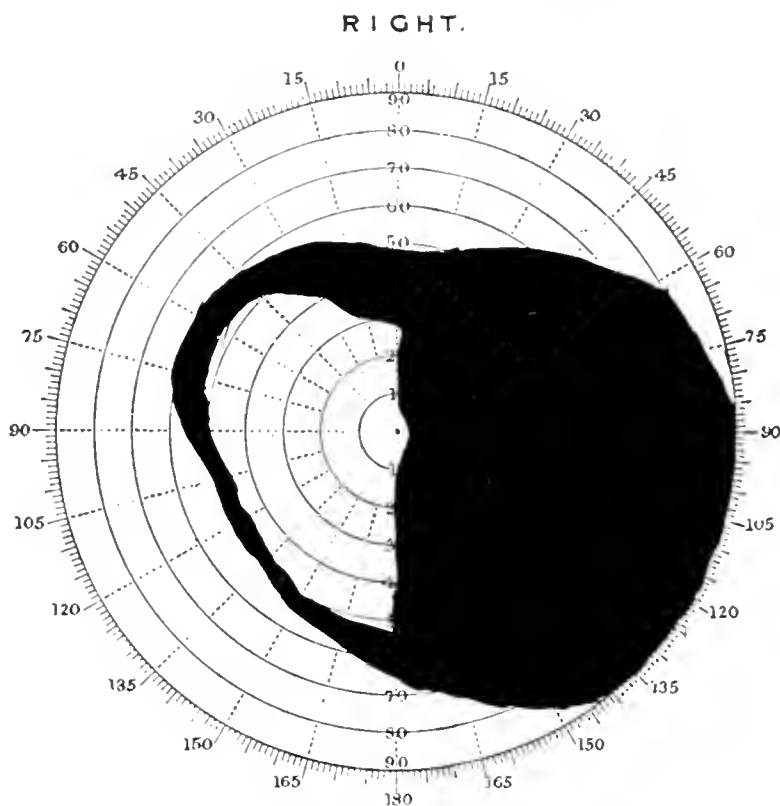


Fig. 4.
Acuity of vision, $R = \frac{6}{36}$ L. = nil.

National Hospital July 10th, 1905, under Dr. C. E. Beevor, complaining of headache, vomiting, mental change, and dimness of vision. The headache started about two years before admission, and the eyesight had been getting bad since about six months, especially in the right eye.

On examination by Dr. Gunn, both discs were pale, the left decidedly so, and both had an opaque appearance as if at one time they had been involved in a subacute papillitis. There was a little connective tissue in the center of the right disc.

Vision fields (vide Fig. 3) shows definite bitemporal hemianopia involving the fixation point of the right, sparing it to a certain

extent in the left. Acuity, L.=6-30, R.=macular vision nil.

Pupils: R. larger than L., and shows marked ectopia pupillæ, being transposed in an upward and inward direction,—both react to light and accommodation, left better than right.

CASE 3. W. K., male, aged 45, grocer, was admitted to the hospital under Dr. Risien Russell on Nov. 15th, 1904, complaining of loss of eyesight and inability to open left eye. The patient has had ptosis of the left eyelid for 2½ years, gradu-

Fig. 5A.

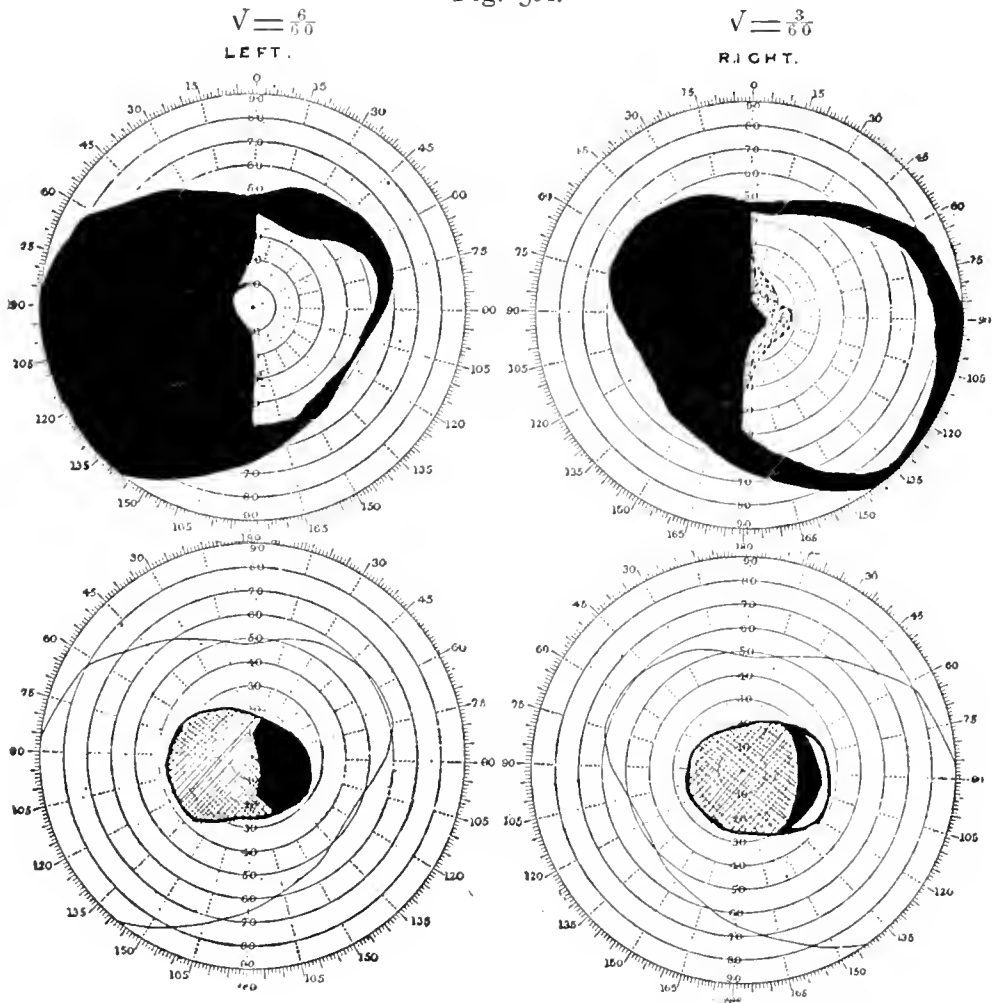


Fig. 5B.

- A. White fields.
 - B. Red fields, showing defect to the left.
- Acuity of vision L.= $\frac{3}{60}$ R.= $\frac{3}{30}$

ally increasing and associated with diplopia on looking to the right, with diminution in vision in the left eye for the past year and a half. One year ago the acuity of vision was tested and showed 6-6 in right eye, with only ability to count fingers in the left. For the past four months the patient has noticed that he cannot see objects to his right side.

On admission, he has double optic atrophy. The acuity of

vision for the right is 6-36, the left, nil. The right field shows loss on temporal side (vide Fig 4).

There was complete third nerve paralysis on the left side with ptosis and dilated pupil. He complained also of severe paroxysmal pain over the left trigeminal region with hypersensitivity to painful and tactile stimuli.

In both these cases, to summarize, there was a tumor of the pituitary gland (removed at operation by Sir Victor Horsley). In the one case more extensive to the right side, in the other to the left, as shown by the associated oculomotor paralysis. In each case we find macular vision is nil on the side to which the growth is more extensive, while in the other eye, though macular vision is decidedly impaired, it is still fairly good, 6-30 in one case and 6-36 in the other. This can be accounted for by the uncrossed macular bundle being spared, while the impairment of

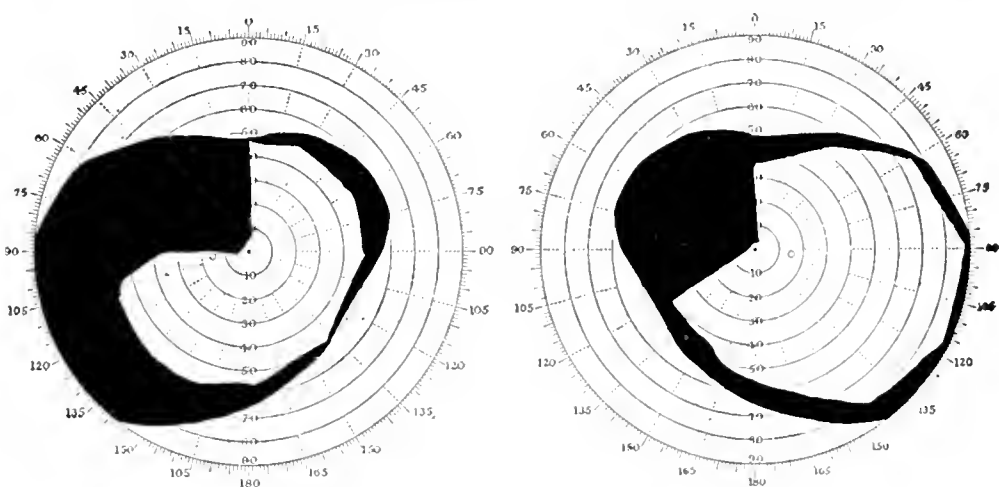


Fig. 6.

vision is due to the destruction of the crossing macular bundle.

CASE 4. Pressure on right optic nerve; right side of chiasma and right optic tract.

W. A., male, aged 37, clerk, was admitted to the hospital Jan. 27th, 1905, under Sir William Gowers, complaining of headache, loss of vision, and fits. His eyesight had been getting bad for the last five months, and he noticed that he could not see to the left.

On examination the right optic disc showed reddening of the upper edge, the left subacute optic neuritis with +2 diopters swelling.

The fields of vision showed left homonymous hemianopia with very great impairment of macular vision in the right eye, less in the left, the acuity being, right, 3-60; left, 6-60 (vide Fig. 5). Here the position of the tumor was verified at autopsy.

In this greater impairment of macular vision, lesions of the optic tract differ from what one sees in lesions of the optic radia-

tions and cortex. In these latter situations, with their bilateral innervation and wide representation in each cortex, the macular fibers are seldom sufficiently damaged to cause much impairment in acuity of central vision, while in the former situation their position exposes them to greater dangers.

CASE 5. *Incomplete lesions of the optic radiations.*

E. M., male, aged 37, tobacconist, was admitted on the 4th of July, 1904, under Dr. C. E. Beevor, complaining of fits and disturbance of vision. His past history was negative, and he denied venereal disease.

Two years ago he had a general convulsive attack, with loss of consciousness, coming on without warning and leaving no weakness of the extremities on either side. Ten months ago he had the first of a series of attacks, which he describes as visual delusions,—he would be looking at some object when he would

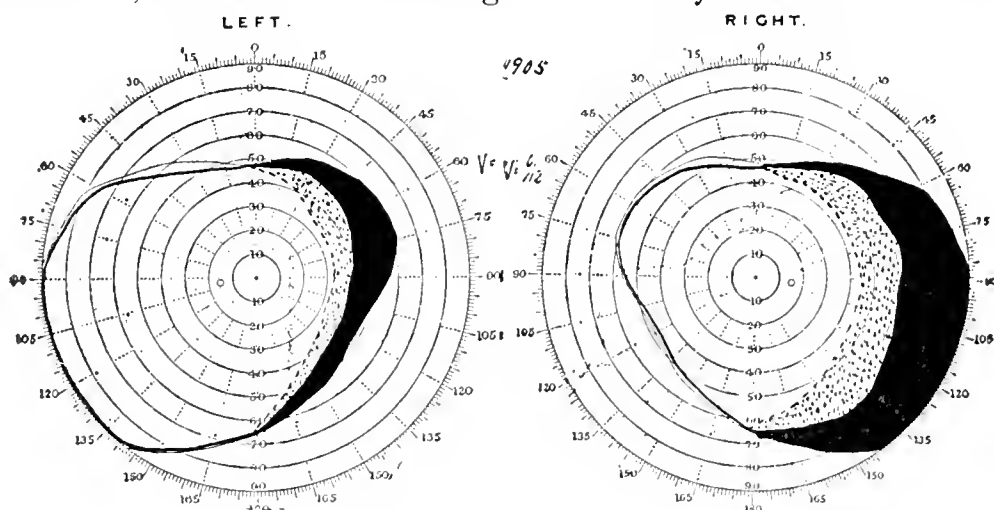


Fig. 7.

Acuity of vision, R. = $\frac{6}{12}$ L. = $\frac{6}{12}$

become aware that he was unable to see the whole of it. On one occasion, when looking at a tray with two wineglasses, he found to his surprise that he could only see one. Such attacks lasted only a few minutes. He had four in all. Two months ago he suddenly became unconscious while riding a bicycle and fell, but soon regained consciousness and was not paralyzed. He had some sensations of tingling, starting in the left foot and traveling up the leg to the arm. He had never suffered from headaches or noticed any weakness or giddiness.

On examination, the optic discs were normal, the fields showed homonymous quadrantic defects, as in charts (vide Fig. 6). The pupils were equal and reacted to light and accommodation, the right better than the left. The cranial nerves were otherwise negative.

Motor System: There was some very slight relative weakness of the left side. The reflexes were normal and equal on the two sides.

He was thought to have a vascular lesion of the right lobus cuneus and was kept under observation outside the hospital. He was readmitted in December, 1904, with definite signs of cerebral tumor and more advanced defects in the fields of vision.

At operation, the postcentral convolutions were found flattened, and on being incised a cystic tumor was found extending downwards and inwards; this was removed. When the patient was sufficiently recovered, he was found to have complete hemianopia, sparing macular vision in both eyes.

CASE 6. *Incomplete lesions of optic radiations.*

E. M., male, aged 39, carman, admitted May 31st, 1904, under Sir William Gowers.

The patient had a superficial tumor removed from the left supramarginal region by Sir Victor Horsley, and on recovery was found to have limitations of both fields to the right, as seen in Fig. 7. The acuity was 6-12 in either eye.

In Case 5 it seems probable that the tumor in growing impinged first on the lower fibers of the radiations supplying the lower quadrants of the retinae and caused loss of vision in the upper homonymous quadrants of the fields,—according to Henschen's localization of the fibers already quoted.

While in Case 6 the lesion in the supramarginal region would involve the radiations in their lateral aspect and damage some fibers to the upper and some to the lower part of the retinae, thus accounting for the homonymous constriction of the fields.

In conclusion, my best thanks are due to the members of the Visiting Staff of the Hospital, who have so kindly permitted me to use their cases.

THE CONNECTIVE TISSUE CHARACTER OF THE SEPTA OF THE SPINAL CORD AS STUDIED BY A NEW STAIN.*

BY ALFRED REGINALD ALLEN, M.D.,

OF PHILADELPHIA.

FROM THE DEPARTMENT OF NEUROLOGY AND THE LABORATORY OF NEUROPATHOLOGY OF THE UNIVERSITY OF PENNSYLVANIA.

In working on this new method of staining nervous tissue, I have been able to demonstrate the fact that the posterior medium septum of the spinal cord, as well as a number of the septa of the lateral columns, contain connective tissue which is continuous with the pia. This statement is at absolute variance with the teaching that these septa are composed of exclusively neuroglia tissue.

In staining to demonstrate these pial septa the method is as follows:—

(a) The material should be hardened as if for staining by the Nissl method.

(b) Sections, after washing in distilled water, are placed in a 0.5% aqueous solution of azure II. (or azure I.) and steamed for two or three minutes and then allowed to cool for about fifteen minutes.

(c) Wash in distilled water.

(d) Place in absolute alcohol and gently agitate until clouds of blue cease to be given off.

(e) Place in a mixture composed of carbolic acid 20 toluol (boiling point 110°-112°) 80 for about one minute.

(f) Place in a solution of eosin (Grübler w. g.) in absolute alcohol (alcohol 60, eosin 0.02-0.05), and as soon as the change from dark blue to purple becomes pronounced, remove at once and—

(g) Place in carbol-xylol (25% solution of carbolic acid in xylol). Remove section from this before it turns pink, as after this the differentiation is greatly impaired.

(h) Place in pure xylol.

(i) Mount in xylol balsam or xylol damar.

The only difficulty that will be experienced by those using this stain for the first time will be the steps marked "f" and "g"

*Read before the Philadelphia Neurological Society March 27, 1906.

Only practice will teach when to take the section out of the eosin-alcohol solution. I advise those wishing to obtain good results to pass through two sections, leaving the first in the alcohol eosin solution only five seconds and the second section about a minute, and then examining each to determine the faults of the two extremes.

In a properly stained section the pia is a vivid pink and the subpial neuroglia tissue blue. The tigroid substance of the anterior cornual nerve cells is well brought out, and the structure of the dendritic processes is particularly clear. There is a differentiation in the walls of the blood vessels, the intima and media staining blue, the adventitia pink.

When sections are hardened in Müller's fluid, the nerve cells lose their Nissl granules. If the material be first placed in formalin solution 5% to 10% for two or three days, and after that in Müller's fluid, the Nissl granules are preserved, but in this case the differentiation between the pia and the subpial neuroglia tissue is lost. The hardening in Müller's fluid, after the use of formalin, gives a very beautiful picture, in that it brings out the axis-cylinder processes, staining them blue. In this case the medullary sheath stains blue.

A longitudinal section of the spinal cord shows very clearly the collateral branches of the axis cylinders.

This stain does not give any better results with material kept too long in the hardening fluid than can be obtained with any other process.

Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION.

Thirty-second Annual Meeting, Held at Boston, June 4 and 5, 1906.

The President, DR. HENRY R. STEDMAN, in the Chair.

(Continued from page 721.)

The Relation of School Work to the Mental Fatigue of Children.—
By Dr. B. Sachs. (See this journal, p. 745.)

Dr. Walter Channing said Dr. Sachs had given us a paper which is bound to be of value to the community. He thought that in some ways he is entirely justified in the statements he makes, but in other ways he goes rather too far. Dr. Channing had been for ten years a member of the school board of Brookline, and all of these questions come up for consideration. Possibly Dr. Sachs' experience may be somewhat different from that of those who come directly in contact with school children.

It is not always in the very young children that we see these cases of partial or complete breakdown. Of course it is a very difficult matter to determine how much is due to the school and the environment of the home. A child is sent to school who is not very strong, consequently the child, not being able to stand the school work, breaks down. His experience has been that girls in high school do break down, although he would not say purely as a result of school work. There is never a time in the high school that there is not a certain number of girls who are unable to do all the work and break down at least once in the year. It is not, of course, on the neurasthenic side only that we find symptoms of over-strain. Troubles incident to defective sight and hearing frequently develop in the school period. It is surprising the number of defects that are found in these directions. Dr. Channing believed that school work is often the direct exciting cause of breakdown in health, although it is impossible to say that home influences are not also largely responsible.

We must expect in these days that the schools will take a great deal of the care and management of the child, and it should be more and more its function to look after not only the mental development of the child, but his physical condition and care. This part of the question is being more and more considered by school boards.

Dr. Adolph Meyer thought that the fact that this question has been brought up is very much to be welcomed. The standpoint of Dr. Sachs is interesting because it turns away from that continual fault-finding with the school, which is so prevalent to-day. Dr. Meyer had of late been led to take considerable interest in the question, and he thought the neurologist has special reasons to take interest in the public schools, not in censuring them all the time, but in aiding the work. If we neurologists help the teachers with occasional visits to the schools, start with the proposition that the schools naturally want to do the best they can, and give them our support instead of always repeating what others say, we shall do much for the community.

The schools must adopt themselves to the children they get. They are anxious to have special classes for defective children so far as possible. The home surroundings are undoubtedly much more at fault than the schools, and the object should be to make the efficiency of the school tell in the directions in which the parents need guidance.

Dr. Walton said he was thoroughly in accord with all the propositions

of Dr. Sachs. He did not remember a case of nervous breakdown really attributable to any tax imposed upon the child's vitality by school requirements. It always proves that the school work is merely the occasion or the exciting cause of a breakdown of which the child's neuropathic and generally precocious tendency is so evidently the underlying and real cause that the child was bound to break down in any event through its own obsessive tendencies, worries and other faulty mental habits, whether engaged in school work, emulative sports or interests outside the school, educational or social. In the child, as in the adult, worry, "New England conscience" and allied vicious mental tendencies, for which Dr. Walton had ventured to coin the word "obsessia," cause more nervous breakdowns than mere work, however arduous.

Dr. Bender said he had occasion to study this subject a few years ago, and in connection with that study he read a report of the National Society of Educators, and was surprised to find how many prominent educators mentioned the fact of overwork amongst school children; so many that he was led to think that it was the consensus of opinion among them. He had the impression that taking America as a whole we cannot get away from the fact that overwork does exist among school children. He had no doubt that Dr. Sachs is right to some extent; that is, that if the children could be divided and work given for the weak, and work given for the strong, we might have a better condition of things, and that we must take into account that many children are naturally weak, and would break down anyway; but on the other hand, our schools should be for all, not only for the weak and defective children, but also for children who in constitution may not be equal to the average school work, and the ordinary teacher could not select in advance, and say that a certain pupil was not capable of doing the work set before him. Therefore, our schools should be arranged for the average pupil, which means in many instances far below the normal. Anyway, the health of the children should not be injured.

Dr. Bender suspected that Dr. Sachs may be right in some things he says, but he also suspected that the amount of work is greater than it used to be. The selection of work is not always the most advantageous according to the child's degree of intelligence and development. Therefore, although it is not well for physicians to exaggerate the harm schools may be doing, it is well to exert a kindly interest in the schools to see if some improvement may not be of service.

The most important and also the most difficult thing to do is to adapt the school work to the different kinds of children with different physical make-ups in regard to endurance of the mental and emotional work in the public schools. In some schools they have learned to grade better than in others. The time will come when in grading school authorities will allow for this difference in the mental and physical make-up of children, and make such arrangements that the somewhat weaker child may not be humiliated. A child is humiliated by putting him in a lower grade. If it could be arranged so that a change might not humiliate a child it would be an advantage.

Teachers are so different. While Dr. Bender's experience was not so great as to the harm the school is doing the children in producing nervous diseases, it was large enough to tell him what harm the work is doing the teachers, and when the teacher's health is impaired that teacher is no longer able to guard the children against the harm the school work might be doing them. He thought if we had a thorough medical inspection of schools there would be great improvement along these lines. We should have a system of instruction in our medical schools to give a course of instruction in regard to the medical inspection of schools. If this was done we might possibly have a better grading that might put our schools in better condition for our children, and while we do not wish to speak against the schools, we should have the public bear in mind some improvements which might be made.

Dr. F. N. Dercum was entirely in accord with Dr. Sachs. As a matter of fact, such adjustments take place automatically. Practical experience with the classes as a whole soon fixes the limits to which the teaching can go, and the teaching becomes standardized so to speak for the normal child. So well do we recognize this fact in practice that in determining the mental status of a child we habitually ask as to its progress and standing in school and we judge the child accordingly.

Dr. Fry said that Dr. Sachs' paper impressed him as defining very well to what extent the neurologist may be of professional service to the pedagogist. There is in this country, as elsewhere, an intelligent class of pedagogists quite sure of their own capacity to arrange the curricula for our schools and matters pertaining thereto. This is the class of pedagogists whom we may trust. It is they that are looking to the neurologist to help them establish a basis or method in solving the problem of defective children, or better, of pathological defectiveness in children; for instance, Dr. Fry knew a gentleman of this kind in St. Louis who has tried to bring this matter practically to the attention of the members of his own pedagogic society by collecting clinical histories of children who have had to be removed from school, and analysing them and presenting them in as practical way as possible so that his associates would be instructed thereby. He has sought the aid of neurologists in attempting to do this. Many like him are looking to us for practical data along this line. Yet the full solution will only come with extensive and most intelligent inspection. Nine-tenths of the inspection is ineffective because undertaken by unqualified persons.

Dr. S. J. Schwab said many thoughtful people who understand this subject quite well believe that pupils should be graded in classes according to their intellectual ability, and if such a classification could be made it might be a good thing. There has been a classification in accordance with the intelligence of the pupil in Germany. They want to take the child that is normal away from the child that is abnormal. Dr. Schwab asked Dr. Sachs if he thought that is proper.

Dr. Knapp said he must agree with Dr. Sachs absolutely and entirely. He could not think that the modern, rose water, predigested methods of education can cause so great a breakdown as people seem to imply. If it can, the brains of our children are made of poor stuff. In regard to children below the age of fifteen the diagnosis of neurasthenia, in his experience, is one of exceeding rarity. Furthermore, he took occasion some time ago to go into the question of school work in its relation to the nervous diseases of school children below the age of fifteen. He found very little evidence of overwork. In only a few instances could he satisfy himself after the most thorough investigation that overwork in the schools was one cause or even a contributing cause of nervous diseases. There were a few cases of chorea where there had been more home study than was desirable, but in every instance which he could recollect there were many other factors which would tend to nervous breakdown. It is a matter of almost every-day experience that the parent will say, "Is not the work in the school doing this child harm?" The child may be a spoiled child, sitting up till all hours of the night, and having a vast amount of social excitement. Of course there is the factor of eye-strain, which may be aggravated by school work. That is a little bit out of the question which we are now considering. Those are conditions which can be corrected, and when it is done, school work can go on perfectly and well.

In a few instances in the case of defective children school work may prove injurious; the emotional factor in school work may cause trouble. Furthermore, there are exceedingly few cases of neurasthenia in adults that are due to straight work, and it is the same with children.

Dr. Bullard did not wholly agree with the conclusions of Dr. Sachs. He agreed with some of his statements, and accepted them fully, but it seemed to him that others of them are not wholly justified. In the first

place he saw many children who are injuriously affected by their school work. They do not have the typical symptoms of neurasthenia, but they show it in other ways. That in these cases school work is the only factor no one wishes to claim, and we all know that their home life has much to do with it, but that school work is also an important factor in many of these cases, seems undoubted. One proof of this is that these conditions increase and become very much worse just before the examinations, when children are working harder, and the element of worry is added.

We cannot say that children are not affected simply because certain typical symptoms are not found. He thought that school work is a contributing factor very often in the chorea of school children, as well as in the ill-health of girls from 13 to 15, not only in the public, but also in the private schools. He had seen many cases in girls who are preparing for college. A considerable number of children, those who have not the average ability, backward children, and those mentally deficient, need not be considered in this discussion. The class of children of whom he spoke are bright, intelligent and quick-minded, but are delicate children, and need entirely different care and treatment from those of imperfect development. For children of this class much might be done in improving our methods of education.

Dr. Bertha C. Downing said she had spent the past year in the search in a similar line at Clark University; an outgrowth from ten years' experience in work for the feeble-minded and one with the insane. Experiments show that these classes are in a chronic state of fatigue. In her work this past year she had been trying to get at some of the roots, as to causes of sub-normal children and insanity. She found that the nervous are reported as "nervous" by the examining physicians. This holds in the city of Worcester, Mass., but she found in the last-named city that over one-half of these are *abnormally* nervous, and had better be called "*neurotic*." A study of parents of the insane and feeble-minded shows that "*neurotic*" children make just these parents, and that a remarkable number of the insane were "*neurotic*" children.

These neurotic children would be saved in many cases from a downward course, if school children were classified by types, and the other children would also profit by this division. The classification to-day is that of John Sturm, of the Middle Ages. That all children must have physical culture, sloyd, kindergarten, etc., is harmful. In these days of preventive medicine physicians could help much by emphasizing this need of a new classification.

She felt sure the study of the insane, as well as that of the epileptic, can never be complete without a scientific knowledge of the sub-normal (fatigue) child.

The bottle-fed baby and the thyroid gland need to be studied along these lines.

Many feeble-minded children are bottle-fed, and no other cause for their sub-normal condition can be found.

We know the thyroid treatment for the cretin is almost a specific. The Mongolian idiot improves with this treatment.

Research shows the thyroid gland of the mother increases in size during pregnancy and remains enlarged during lactation, proving that it is connected with fetal development. The thyroid secretion for the growth of the infant is supplied through the maternal milk—cow's milk does not contain thyroïdin. More should be done in the study of pigmentation.

All of the Mongolian type of feeble-minded at the Massachusetts school are blondes. All but two of the congenital cases of feeble-minded at the New Jersey school are blondes.

In Denmark the majority are brunettes. Gen. Woodruff's epoch-making book, "Effects of Tropical Light on the White Man," shows that as the

blond races travel south they become degenerate, and as the brunette goes north they degenerate, due to fatigue, because of wrong environment, causing malnutrition.

Charlottenberg, Germany, offers a suggestion as to what might be done in our American cities for delicate and feeble children. "Forest schools" have been established, an account of them may be found in *Le Musee Social*, November, 1905. In less than three months the average weight of each child increased 6½ pounds. The lowest gain, 5 pounds.

Dr. Sachs said he was very glad that his paper brought out so much interesting discussion. One reason he brought up this subject is that the teachers themselves feel that there is an unjust prejudice among the public. He thought there is no body of men who are more able to judge of the effect of school work upon these children than a body of neurologists. It has been clearly brought out during this discussion that many of the conditions which are now thought to be due to overwork amongst school children are not due to overwork in the school, and that the teachers may rest assured that they need not pay any heed to the hue and cry which is so prevalent.

He omitted purposely any reference to the conditions of eye-strain and other physical conditions. In regard to the question which Dr. Schwab raised whether or not to divide children according to the different degree of intelligence, he thought that should be left to the teachers. Remembering that the vast majority of children are normal, we should devote our attention to them, and not so much to the small class of children who are below the average.

Now it would be very good if we could adopt the plan as proposed by the last speaker; that is, divide the types, but this is not an easy thing to do. The people who have much to do with children will very soon be able to recognize the abnormal child.

The question has been one well worth discussing. The statement coming from the neurologists of this country proves that the so-called mental fatigue of children is a subject which the teachers can practically disregard.

A Definite Clinical Variety of Cerebral Arteriosclerosis.—By Dr. Joseph Collins. (See this journal, p. 750.)

Dr. McCarthy said: When this group of symptoms occurs with the symptomatology as given here, every one who has anything to do with hospitals must recognize this class of patients Dr. Collins has described. As we study these cases we must be impressed by the fact that the most intense symptoms of arteriosclerosis of the brain may show no symptoms of brain disease.

He had made several examinations of brains of arteriosclerotic persons lately, and in the examination of the interstitial tissue had found here and there spots of softening, spots of cystic degeneration around the blood vessels themselves. It stands to reason when these changes occur in the spinal cord they may cause these varying types of paralysis. They may also occur in parts of the capsule without causing any symptoms at all.

The point he wished to make is that in these temporary palsies of the spinal cord a presumptive diagnosis of arteriosclerosis may be made, but it cannot be determined how extensive it is.

Dr. Spiller said the description given by Dr. Collins is familiar to us. There are many cases in the Philadelphia General Hospital and elsewhere like those he describes. It is true that often there are no symptoms of arteriosclerosis when the lesions are not intense. Minute areas of softening often occur in arteriosclerosis, and may escape detection, as they are invisible to the naked eye.

Dr. Collins said he knew of no more difficult subject in the department of psychiatry than to state the relationship of mental disorder to arterio-

sclerosis. Many cases of involution melancholia have no arteriosclerosis. The same is true for paresis and other psychoses of maturity. Therefore he would be glad sometime either to see something in the literature about it, or referred to at one of the meetings. His cases have nothing to do with senility. They are not senile by any means. In his most typical case the age was only forty-seven years. We have in this clinical syndrome a train of symptoms pathognomonic of intracranial arteriosclerosis, even though there are no symptoms of splanchnic arteriosclerosis.

Obstetric Paralysis.—By Dr. William N. Bullard.

The literature of obstetric paralysis is almost all very recent, in large part since 1900. We divide obstetric paralysis into three forms: I. The upper arm type. II. The lower arm type. III. The other two combined—paralysis of the whole extremity. The upper arm type is the common form and we shall consider this form only in this paper. Erb showed that this type of paralysis was due to injury or lesion of the fifth or sixth cervical nerve roots. The exact pathological condition has been the subject of many theories. It has now been shown, however, that it is due to a stretching, ravelling or laceration of these nerve-roots or their corresponding nerves.

The method of production at child birth is still not perfectly clear. It is caused by a strong traction favored by a firm resistance against which the pull is made. The traction is more effective if the nerves are already in a state of tension. Asphyxia has been considered as a favoring factor.

Statistics as to severity of labor and other conditions.

Clinical Conditions.—Muscles involved. Effect produced by the weakening of the muscles involved. Anatomical explanation of the position assumed by the paralyzed limb. Action of the separate muscles.

Atrophy of the muscles. Atrophy of the bones and other tissues. Adhesions about the joints. Displacements of the head of the humerus. Pathological changes in and about the elbow joint.

Dr. Clark thought the condition in brachial palsy has now been pretty well established. The pathology is laceration of the nerves and hemorrhages into the sheath. The problem still unsolved is the question of treatment. In a series where he had tried massage the results have not been what he should have liked, for the reason that the lesions have been more extensive than was heretofore supposed, and that in severe cases it extends both above and below the fifth and sixth roots. It has been clinically shown that the muscle is invariably paralyzed, permitting of the subluxation of the scapula that Dr. Bullard speaks of. The question of operative procedure in these cases we must consider from the broadest standpoint. We must take a much broader view than we have heretofore. It ought to be done really in the first few months in order to prevent the trophic disturbances which are never recovered from. Much earlier operation in these cases, if we can determine the degree of injury, will result in a much larger number of improved cases, and possibly some cures.

He was of the opinion that in the condition seen in its worst form where there is extreme laceration, there is little that can be done except by operative procedure. Their work has shown that this lesion is a much more extensive one than heretofore mentioned, and that the nature of the lesion necessitates very early operative interference.

Dr. Bullard said he had not intended to consider the question of treatment at all at this time. He would say, however, that they have been waiting with great hopes for cases which would justify surgical operation. They had succeeded in obtaining fairly good results without operation. Most of their patients with massage and electricity recover the use of the arm with fairly good motion. The elevation of the arm above the level of the shoulder is the most difficult movement to bring back. On the other hand, atrophy of the bones is still untouched. Personally he had seen but one

operation which was temporarily successful, but the child died in two weeks from pneumonia, so that he did not know the late results. It was done when the child was but a few months old, which is the best time to operate.

(To be continued.)

NEW YORK NEUROLOGICAL SOCIETY.

May 1, 1906.

The President, DR. JOSEPH FRAENKEL, in the Chair.

The Chronic Progressive Softening of the Brain. Report of Cases with Autopsies Simulating Cerebral Tumor.—By Dr. J. Ramsay Hunt. The author reported in detail two such cases coming under his observation, and gave the autopsy findings. Case I was of special interest because of the clinical resemblance to brain tumor. The apoplectiform seizure which occurred one year before the appearance of any focal symptoms was of very doubtful nature; there was no paralysis at the time, and the recovery was absolute and complete. After the beginning of focal symptoms in the right side of the face, the course was gradual and progressive, appearing next in the fingers, then in the hand and forearm, and later only slightly in the leg. During this entire period and even antedating the focal symptoms, severe paroxysmal headaches, usually unilateral, were present, with some variable tenderness over the left parietal region. The absence of optic neuritis had given rise to serious doubts as to the real nature of the lesion, but this, as was well known, by no means excluded tumors, especially those situated in or near the cortex. As all the internal measures employed had failed, and as the condition was slowly progressing, surgical exploration seemed not only justified, but imperative. The ill-effects of the surgical measures were to be attributed to exploratory punctures with an aspirating needle, in search of a possible cyst. In diseased and softened brain tissue, aspiration, no matter how delicately performed, was not without danger, and was liable to induce hemorrhagic extravasations, which broke down and formed favorable foci for infection. Furthermore, there was no question that the dangers of infection, even with all modern aseptic precautions, were much more imminent when a softened, ill-nourished area of the brain was the seat of exploration. That danger should always be borne in mind when the cerebral cortex was exposed and found normal, and the question of further exploratory measures arose.

The usual sequence of symptoms in this case, so unlike that of softening in general, was to be referred to the parietal arteriosclerosis at the junction of the internal carotid, middle cerebral and posterior communicating arteries, with occlusion of the central perforating at their point of origin from the main trunks. This lesion had induced a gradual and successive obliteration of these central perforating end arteries, producing the progressive and insidious development of hemiparesis and hemiparesthesia, with objective sensory disturbances. In brief, the picture of the so-called chronic progressive softening of the brain.

In Case II, while the lesion had been progressive, involving first the right leg, then the right arm, and later the left leg, the development was by no means so constantly or uniformly progressive as in case I. The mode of onset, and the acute exacerbations suggested rather a vascular process than a neoplasm. As the symptoms in cases of vascular tumors not uncommonly suffer a sudden increase in the focal manifestations from hemorrhages, and as optic neuritis with beginning atrophy was present, the possibility of tumor in the region of the corpus callosum, invading the Rolandic area on the two sides, was for a time given serious consideration. The marked inertia, extreme apathy, and mental enfeeblement tended

to favor that interpretation; but as the focal symptoms failed to progress materially during eight months' observation, a generalized arteriosclerosis and encephalitis came to be regarded as the probable underlying cause, and the optic neuritis was referred to the glycosuria which was present, or possibly, as was rarely the case, was dependent upon arteriosclerosis of the vessels of the optic nerves.

Pathologically, the case was of interest from the limitation of the obliterating thrombotic process to the central perforating arteries passing to the internal capsule and basal ganglia. The main trunks of the circle of Willis were singularly free from sclerosis, and the thrombi contained in the middle cerebrals were of quite recent origin. More difficult of interpretation was the extensive breaking down of the walls of the lateral ventricles. That process could not be regarded as an encephalomalacia in the ordinary acceptance of the term, as there was total absence of the usual histological changes accompanying such softening; viz., myelin degeneration and granule cells. Only minute hemorrhages and red blood cells were present in the ragged margin surrounding the ventricles, which would seem to indicate that we were not dealing with a post-mortem change or artifact. The periventricular localization of the breaking-down process was also unusual, and suggested an etiological relation to the contents of the lateral ventricle. The influence of diabetes and the tendency which induced to tissue gangrene also arose as a possible predisposing or etiological factor.

In general, Dr. Hunt said, the clinical picture presented by his cases was that of a progressive and gradually developing hemiplegia, and the character of the general cerebral symptoms resembled those described by Wernicke as chronic progressive softening, without evident vascular lesions. The main trunks of the vessels of Willis were free from occlusion, but histological study demonstrated the obliteration of the central end arteries in the ganglionic and capsular regions. It was readily conceivable how such central arteriosclerosis, with occlusion, would not only produce degeneration in the distribution of the terminal end arteries obliterated, but might also determine more extensive areas of softening in that portion of the white substance in the centrum ovale, where the cortical and central circulation met, and which represented an area of diminished nutritional resistance. It therefore seemed that the existence of a progressive softening not dependent upon vascular disease of the type described by Wernicke might be fairly questioned; certainly until demonstrated by a case subjected to modern laboratory methods.

In addition to central arteriosclerosis as a cause of chronic progressive softening must be added constriction and obliteration of the carotid arteries in the neck.

The clinical importance of this subject, Dr. Hunt said, lay in the possible resemblance to abscess, encephalitis, and tumor of the brain.

Dr. Joseph Collins said he had recently devoted considerable attention to this subject, and the only criticism that he had to offer of Dr. Hunt's paper was relative to its title. He did not think these cases should be called instances of chronic progressive hemiplegia without stating that they were of arteriosclerotic origin, and he believed that the most appropriate name under which they could be classified was cerebral arteriosclerosis. From a careful review of the literature on the subject, he had no hesitancy in stating that all the cases of so-called chronic progressive hemiplegia were of arteriosclerotic origin.

In connection with these cases, Dr. Collins said, we should not fail to appreciate the fact that while in many instances we may have to deal with a generalized arteriosclerosis, there were others in which the arteriosclerotic changes were strictly localized to certain viscera or sections of viscera, the blood vessels in other sections of the body being entirely free from manifestations of the disease. Cases were not uncommon in which the symptoms were indicative of arteriosclerosis, and where the lesions, both

macroscopically and microscopically, were apparently confined to the smaller vessels of the brain, while the basilar and larger arteries were entirely free from any evidences of the disease.

Dr. Collins said that in the May, 1905, issue of *The Post-Graduate*, he had published an article under the title of "A Case of Cortical Cerebral Arteriosclerosis, with Distinct Focal Symptoms," which reported in detail the history of a hard-working married woman, fifty years old, whose symptoms, as well as the autopsical record, parallelized, in almost every item, those which Dr. Hunt had presented. The symptoms in his case, Dr. Collins said, seemed to indicate that the lesion was a generalized arteriosclerosis, with focal manifestations in the left motor cortex, but there was such diversity of opinion among the physicians who saw her, several of whom made the diagnosis of hysteria, that the subsequent history of the case proved both useful and interesting.

In speaking of the differential diagnosis between brain tumor and cortical cerebral arteriosclerosis, Dr. Collins said he thought the occurrence of progressive hemiplegia in an individual over fifty years old had no more merit as a diagnostic feature of brain tumor than a dozen other symptoms that might be mentioned. On the contrary, that symptom, occurring in an individual over fifty, should excite the suspicion of cortical cerebral arteriosclerosis.

In concluding his remarks, Dr. Collins again emphasized the fact that arteriosclerotic conditions might be either local or general, and that in the proper recognition of their effects, splanchnic arteriosclerosis must be entirely divorced from arteriosclerosis of the brain.

The President, Dr. Fraenkel, said that the second case reported by Dr. Hunt was under his observation for a time, and he regarded it as one of brain abscess. The symptoms pointed to such a lesion, and the post-mortem explanation of the case was not quite satisfactory. The accumulation of broken-down material could very well explain the clinical impression of abscess. Dr. Hunt's paper was of great importance in calling attention to arteriosclerosis as a factor of progressive hemiplegia.

Dr. Hunt, in reply to Dr. Collins, called attention to the fact that he had reported his cases under the title of chronic progressive softening of the brain; not as cases of chronic progressive hemiplegia.

A Case of Huntington's Chorea.—Presented by Dr. Edward D. Fisher. The patient was a man, thirty-five years old, who gave a family history of this disorder, his father and an older brother having died of the same disease. In the case shown, the symptoms had first manifested themselves about three years ago. They had progressed steadily, and assumed a choreiform type. Speech was affected, but there was no disturbance of mentality. The reflexes were exaggerated. There was no pain. A younger brother had recently shown the initial stages of this same disorder.

Dr. J. F. Terriberly said that Dr. Fisher's case recalled a similar instance in a family which he had observed for a number of years, in whom three male members were victims of this disease. Two had died, while the third was still mentally clear and able to work, although his condition was very distressing. Attempts at talking were accompanied by exaggerated movements of the face and extremities.

A Case of Arteriocapillary Fibrosis Localized in the Medulla, and Clinically Resembling Myasthenia Gravis.—By Dr. Harlow Brooks. The patient was a male, forty-three years old, born in Russia, and for twelve years a resident of the United States. His occupation was that of a photographer. His father died from diabetes, which terminated in "brain fever." His mother died from pneumonia. He did not know how many brothers and sisters he had, but remembered that a great many of them died. Four, including the patient, were still alive, and, with the exception of himself, were in good health. There was no history of malignant, tubercular or syphilitic taint.

The patient's present illness began four years ago. He first noticed

that his fingers became weak while holding a photographic plate, which finally fell from his grasp. When he stooped to pick up the plate he could scarcely raise himself upright; he apparently lost control of the left arm and leg, and barely managed to crawl to the adjoining room, where he was put to bed. He did not remember what happened to him after that for fourteen days. After that attack he was regularly treated by a physician, who employed drugs and electricity. Under that treatment he gradually regained control of the paralyzed extremities, and after some months he was able to return to his work. In August, 1904, he began to feel very weak and could not stand upright. He had no pain; no convulsions, but his statements in that regard were somewhat conflicting.

Upon admission to the Montefiore Hospital the patient complained that he felt weak. He could not stand upright. There was no pain nor dizziness. He complained of double vision. There were no enlarged glands. The expression of the face was pathetic, dull and listless. Innervation of face normal. No nystagmus, and the pupils reacted to light, pain and accommodation. Ears normal. The abdominal and thoracic viscera were apparently normal, with the exception of a rough, systolic murmur. The knee-jerks were apparently diminished. The tendo Achilles reflexes were present. The Babinski reflex was absent.

On Feb. 13, 1905, the patient was allowed out of bed. He complained of nothing in particular. On June 29, after a warm bath, he began to complain of dyspnea, which, in spite of cupping and other treatment, gradually became more severe. Moist, gurgling râles were heard over the upper portions of the lungs. Death occurred on the following day.

After reporting in detail the post-mortem and pathological findings, Dr. Brooks said that clinically this case seemed to correspond quite closely to the picture of myasthenia gravis pseudoparalytica, the presence of the symptom of muscular tiring being very well marked, particularly in the muscles of the speech. Furthermore, the myasthenic reaction of Jolly appeared to have been present, although the speaker said he understood that that reaction was by no means diagnostic. No macroscopic muscular atrophies were present.

Pathologically, the case was clearly not one of myasthenia gravis pseudoparalytica, since lesions were found which abundantly explained all the symptoms present, and even the cause of death. Muscular atrophy, though of but limited degree, was present, and the medullary changes were pronounced, though a very careful gross examination, in which particularly minute note was made of medullary conditions, failed to demonstrate any morphological alterations, and only close microscopic study demonstrated the vascular alterations which abundantly explained all the symptoms.

The vascular disease was clearly allied to arteriofibrosis, and the remarkable feature of this lesion was its markedly limited distribution to the trunks of the medulla almost exclusively. It was of course manifest that the symptoms appearing four years before the onset of the complaints which the patient presented on entrance to the hospital were due to cerebral hemorrhage.

In attempting to discover an etiological factor for the explanation of these pronounced vascular changes in so young a subject, Dr. Brooks said he did not think we had far to look. It had been abundantly demonstrated that excessive use of tobacco produced arterial disease of marked degree; nicotine in itself was one of the most active vaso-constrictors, and it seemed highly probable that the excessive use of tobacco in this case was productive of those vascular changes, chiefly confined to the medulla, which gave origin to the symptoms indicative of myasthenia gravis.

Dr. B. Sachs said the subject of myasthenia gravis pseudoparalytica was a very difficult one, and he thought it was still an open question whether or not there was an anatomical lesion underlying the disease. Some had reported the presence of such a lesion, while others had doubted

it, and while that aspect of the subject was still *sub judice*, the least one could do was to clearly establish the clinical picture of the disease.

In the case reported by Dr. Brooks, the speaker said, he failed to see any clinical grounds upon which to base the diagnosis of myasthenia gravis pseudoparalytica. While the patient had some bulbar symptoms, there were no autopsical findings to account for them. All that we had a right to say was that it was a case with more or less pronounced bulbar symptoms, and such cases were not uncommon. Years ago, Westphal reported a similar case, without anatomical findings.

Dr. Fraenkel said he wished to confess that he was the first one to suggest the diagnosis of myasthenia gravis pseudoparalytica in the case reported by Dr. Brooks. The case had been presented to him as one of hysteria or neurasthenia. He could not accept either of those diagnoses, and from the absence of objective symptoms at the time of examination, and the disproportion between the extent of the medullary symptoms at the time of the seizures and the lack of such symptoms during the intervals, he thought a diagnosis of myasthenia gravis pseudoparalytica was justified. He conceded that it was not a typical example of that affection, and thought it possibly represented a transitional stage.

Dr. Joseph Collins said he regarded Dr. Brooks' paper as a most important contribution to the pathology of the central nervous system. It described a transitional stage between cases that were apparently without anatomical foundation, and others in which the anatomic conditions had been demonstrated. The speaker said that in his opinion, however, Dr. Brooks' case had been reported under a misnomer, and so far as he could see, there was no justification for the diagnosis of myasthenia gravis pseudoparalytica. A dozen characteristic symptoms of that disorder could be enumerated that were apparently entirely absent in Dr. Brooks' case. Why was it necessary to take a case that presented all the symptoms of bulbar paralysis, such as Erb had recently described, and call it myasthenia gravis pseudoparalytica? A similar case had recently been reported to the society by Dr. Edwin G. Zabriskie and himself. The speaker said he now had the records of five cases of spinal arteriosclerosis in which the general arteriosclerosis was not pronounced, but the changes in the cord were profound. In one of them the clinical picture was that of Landry's paralysis. He ventured to say that Dr. Brooks should have reported his case under the head of arteriosclerosis of the oblongata, producing the clinical features of asthenic bulbar paralysis.

Dr. Terriberry said that most of the symptoms of myasthenia gravis pseudoparalytica were absent in the case reported by Dr. Brooks, while a number of the symptoms mentioned were not present in that disorder. The clinical picture corresponded more closely to that due to a weak and flabby heart; the acute crises, with edema of the lungs, could thus be readily understood. That view was also supported by the post-mortem findings, the heart being large, its muscles flabby, and its vessels diseased. As we had no knowledge of the pathological substratum of myasthenia gravis pseudoparalytica, and as a most careful and thorough autopsy revealed a more or less general arteriosclerosis, he believed that was the underlying factor in the case, and that the diagnosis as given could not be maintained.

Dr. Brooks, in closing, said he was positive that the cause of death in the case he had reported was not myocarditis; that fact was perfectly obvious to all who saw it. There was no generalized arteriosclerosis, and a minute examination of the viscera showed a perfectly normal set of arteries.

The Surgical Treatment of Trigeminal Neuralgia. A Study of the Causes of Recurrences After Operative Treatment, with Suggestions as to the Best Methods of Obviating Post-Operative Recurrences.—Dr. Alexis V. Moschcowitz read a paper on this subject, in which he offered the following conclusions:

1. Eliminate any possible etiological factors, such as tumors, carious teeth, antral disease, malaria, syphilis, etc.

2. Determine accurately the branch or branches that are involved.

3. The operation should be performed as near to the periphery as possible.

4. The operation should be performed early. This is important, because the earlier the case the more chances there are that a peripheral operation will be of benefit.

5. Whatever the character of the operation may be, the dominant principle must be the *prevention of regeneration* of the affected nerve.

More specifically, the operations may be classified under two headings, depending on the nerve or nerves affected.

(a) Peripheral operations: If the supraorbital, infraorbital, mental, malar, or inferior dental branches, either singly or collectively, are involved, the operation consists in division of the nerve, and plugging up the foramen by a gold or silver button or wire.

(b) Central operations: If the neuralgia involves the upper teeth and palate (superior maxillary division), or the tongue (inferior maxillary division), existing either singly or together with the other nerves described above, the operation as outlined by Abbe must always be performed, substituting, however, celluloid or a gold button instead of rubber tissue.

6. Finally, if the above principles of treatment of trigeminal neuralgia are carried out, Dr. Moschcowitz said he believed that the operation of extirpation of the Gasserian ganglion would become entirely unnecessary.

Dr. F. Kammerer said he fully agreed with Dr. Moschcowitz that the mortality of the operation of extirpation of the Gasserian ganglion for trigeminal neuralgia was high, and furthermore, it would be much higher if all the cases had been recorded. The speaker said that personally he could add two cases to the list of fatalities following this operation. In one, death resulted on the second day from hemorrhage, and in the other from infection on the fourteenth day after the operation. In the last case, severe hemorrhage after evulsion of the ganglion necessitated the use of a tampon.

Dr. B. Sachs said that if Dr. Moschcowitz had any substitute to offer for the very severe operation of extirpation of the Gasserian ganglion, it was something that was very much to be desired. The speaker said he had seen seven or eight of these operations done, and he knew of no other operation that had impressed him so unfavorably, not only because of its extreme difficulty and severity, but also on account of the uncertainty as to whether the ganglion had really been extirpated or not. In some of the cases he had observed, the sensibility of the affected side of the face had not been entirely abolished by the operation, which could be explained either on the ground that there was some anomaly of the nerve to begin with, or else that the ganglion had not been completely extirpated. Dr. Moschcowitz had reduced the problem to a very simple form, and the speaker said he only hoped that the solution he offered would prove correct. By interposing a foreign body between the cut ends of the nerve, or plugging its point of exit, we could be tolerably certain that there would be no actual reunion, but whether there might not be sufficient regeneration to allow certain of the nerve fibres to pass around the foreign body and unite was another question.

Dr. William M. Leszynsky said that one rather suggestive remark by the reader of the paper was that these patients should submit to early operation. The speaker said that within the past ten years he had not seen a single patient with trigeminal neuralgia of less than one year's duration in whom improvement or cure had not followed suitable non-surgical treatment. Various methods of relief were at our command before surgical intervention should be even suggested. Many of these patients who had never submitted to a systematic course of treatment were operated on

unnecessarily. Furthermore, that even after operation on the nerve branches, as ordinarily performed, the nerve would ultimately regenerate.

Dr. Leszynsky said that within the past three years he had seen four cases of severe trigeminal neuralgia cured by non-surgical methods. One of the patients was an old lady, seventy years of age, who had ninety paroxysms of tic douloureux in twenty-four hours, and who completely recovered under medical treatment. She has been entirely free from pain for several years. In her case, an operation had been recommended by several surgeons. In conclusion, Dr. Leszynsky said that of course operation was necessary in some patients, but he thought that the percentage of cases of trigeminal neuralgia in which an operation was indicated was very small.

Dr. Edward D. Fisher said that doubtless the cases that Dr. Moschcowitz had in mind in his paper were those that had failed to respond to the usual methods of treatment. His usual plan in regard to operative measures was to first advise a resection, which would give the patient at least temporary relief, and then later on, if it became necessary, the more severe operation could be done. The operation suggested by Dr. Moschcowitz appeared feasible; it would certainly give the patient a longer interval of relief than any of the well known conservative measures, and was free from the danger of the more radical ones.

Dr. W. Sohler Bryant said that in the light of recent studies, he thought that many cases of trigeminal neuralgia were of reflex origin, and that a certain number might be relieved either by proper investigation and treatment of disease of the antrum or the other accessory sinuses, or by relieving intranasal pressure.

Dr. Moschcowitz, in closing, said that by advising early operation, he did not mean to imply that it should be done before a thorough trial of non-surgical methods of treatment had been given. More particularly, however, by advising early operation he wished to emphasize the fact that this type of neuralgia usually began in one of the smaller branches of the trigeminal nerve, and the cases should be operated on before the larger branches became involved.

Dr. Moschcowitz said the comparatively few cases of trigeminal neuralgia he had seen had been sent to him by neurologists; a point, which to his mind tends to prove that internal medication has been tried to a sufficient extent.

Functional Derangement of the Ears and Upper Air Tract in the Insane.—Dr. W. Sohler Bryant, who read this paper, said the observations upon which it was based were undertaken for the purpose of showing the relation, if any there might be, between insanity and functional derangement of the ear and upper air tract. In order to err on the conservative side, when there was doubt in the results of an observation, it was classified as normal, thus giving the weakest possible showing for the relationship of ear disease, tinnitus and hallucinations of hearing.

One hundred and sixty-one patients were examined at the Manhattan Hospital. Most of these cases were chosen on account of their hallucinations of hearing. The rest were taken by accident without any special plan. The psychiatric classification was as follows: Dementia præcox, 63; paranoia, 20; dementia paralytica, 20; alcoholic insanity, 19; mania depressens, 16; senile dementia, 14; epileptic insanity, 6; various, 3.

The ear classification was as follows: Otitis media catarrhalis, 71; otitis media purulenta, 38 (active or cicatrized); foreign bodies, 14; labyrinthine or nerve disease, 23. In ten of these, the diagnosis was definitely established. In thirteen the diagnosis was not positively differentiated from an adhesive process in the middle ear. Among the 161 cases, fifteen were free from ear disease.

There were hallucinations of hearing in 134 cases; in 120 of these, they were associated with ear disease; in fourteen there was no ear disease. Of the latter, five had tinnitus, and that symptom was present in 63 of the

entire number. There were no hallucinations of hearing in 27 cases, and of that number, 25 had ear disease. Among the 161 cases examined, 146 had ear disease, and 15 were free from ear disease. Only three cases out of 161 had perfectly normal hearing.

Naso-pharyngeal conditions: Total or partial obstruction of the passage, 79; obstruction above the lower turbinate, 15; hypertrophic conditions without obstruction, 37; atrophic conditions, 5; normal, 25.

Naso-pharyngeal and aural diseases in their relation to insanity, Dr. Bryant said, might be classified under five heads: (1) Naso-pharyngeal and aural disease which had no relation to the co-existent psychical disturbances. (2) Naso-pharyngeal and aural disease consequent to insanity. (3) Naso-pharyngeal and aural disease due to the same cause as the co-existent insanity. (4) Naso-pharyngeal and aural disease which were a determining factor in the symptoms of the psychosis. (5) Naso-pharyngeal and aural disease which were the exciting cause of the insanity.

The prognosis for psychical improvement from treatment of the nasopharynx in the cases where the nasal complication was a disturbing factor was good. It was also good when active aural disease was a disturbing factor. The prognosis was bad where chronic, inactive aural disease was the disturbing factor. Those cases were difficult to treat even with the co-operation of the patient. Without that co-operation, they were still more difficult.

Dr. Fisher said that while the statistics given by Dr. Bryant were very interesting, the fact should be borne in mind that there are many sane people who are chronic sufferers from naso-pharyngeal and aural diseases of one kind or another, and a comparative table should be made before we could form a true estimate of the influence of these diseases as etiological factors in insanity.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.

May 17, 1906.

The President, DR. TUTTLE, in the Chair.

Two Cases of Lead Poisoning.—Were reported by Dr. Baldwin, and the patients were shown.

Dr. Knapp had seen several cases of very severe and extensive lead paralysis in the past, in which the legs had been affected, and there was a well-marked toe-drop. Of late years, owing to better prophylaxis in lead factories and among painters, lead paralysis is less often seen, and such severe cases are very rare. The hands of Dr. Baldwin's patient suggest the condition sometimes seen in the early stages of lead paralysis, where the ring and middle fingers are dropped, but the patient can still extend the index and little fingers.

Brain Tumor.—Dr. Waterman showed a specimen of brain tumor which was of special interest on account of the relation of the site of the neoplasm to the character of the symptoms.

The patient was first seen four and a half years ago. She was at that time a girl of thirteen, and had suffered for several weeks from intense headache and persistent vomiting, and from gradual loss of vision. There was a double optic neuritis, but a careful examination disclosed no localizing signs of the tumor, which was apparently the cause of the symptoms.

She was given iodides and improved rapidly, regarding the pain and vomiting, but the loss of sight became nearly complete. Since that time, till recently, she has lived in comfort, though nearly blind, except that every six or eight months she was confined to her bed on account of severe headache and constant vomiting. Each of these spells lasted two or three

weeks and passed off, leaving her perfectly comfortable.

It was in one of these periodic spells of vomiting that she died this spring. She had been vomiting moderately for a day or two, but seemed in no special danger, when after leaving the room for a few minutes the nurse returned and found her dead.

The post-mortem examination disclosed a marked degree of hydrocephalus, which proves to be due to a neoplasm the size of a horse chestnut in the posterior part of the optic thalami, shutting down on the outlet of the third ventricle.

What seems to have taken place is this: The pressure of the tumor would cause an internal hydrocephalus, by preventing the escape of the ventricular fluid. This gave rise to the symptoms of intracerebral pressure, which persisted till the tension in the ventricles overcame the resistance and forced an opening. The patient would then enjoy comfort till the growth of the tumor once more obstructed the outflow from the ventricle.

The cause of the early development of optic neuritis in cases of cerebellar tumor is due to the fact that the internal pressure forces down the floor of the third ventricle and presses the optic chiasm against the bony floor of the skull. This frequently results in a cyst-like protuberance in the interpeduncular space formed by the bulging floor.

Dr. Courtney said that what appealed particularly to him in Dr. Waterman's case was the history of the long spontaneous, pain-free intervals his patient appeared to have enjoyed, in spite of the fact that her tumor was one peculiarly apt to cause great increase of intracranial pressure, both by reason of its size and by the secondary damming up of the ventricles it caused. Had a palliative (so-called) operation been done, the freedom would undoubtedly have been attributed to it. The fact that in this case the pain-free intervals were entirely independent of any mechanical interference, is one well worthy of the attention of enthusiastic operators.

A Case of the Charcot-Marie-Tooth Form of Neuritic Muscular Atrophy.—This was shown by Dr. Thomas. The patient, a girl of eight years, came to the Children's Hospital for the first time on Aug. 19th, 1906. She was born in Massachusetts of American parents, and is an only child, no others having died, and her mother having had no miscarriages. The only illness she has had was diphtheria at the age of three years. There was no history of similar cases, or indeed of any disease in either the father's or the mother's family. The first symptoms of the present trouble were four years ago, when the parents noticed that she turned the toes in while walking, and they thought that the ankles and knees were weak. She also fell rather frequently. They also noticed that she trembled, but this had been so since birth. Examination showed a fairly nourished rather slender child of fully the average height for her years. The gait was with inward rotation of the legs, and turning in of the toes, and was somewhat slow and slightly uncertain, but not spastic or ataxic in character. There was a more or less constant, rather coarse, irregular tremor of the extremities, and to a less extent of the body and head, which was increased somewhat on voluntary motion and ceased at rest. There was in addition moderate unsteadiness of the arms, which was less on the left. There was also moderate unsteadiness in standing with the feet together and the eyes closed. The feet were somewhat shortened and the normal arch deepened, with some twisting, and there was some shortening of the tendo Achillis, though the feet could be brought to a right angle, but very little beyond. On voluntary motion there was a decided weakness of dorsi-flexion of both feet, so that the ball of the foot could not be raised from the floor when the child was standing. All other movements seemed fairly strong, but in grasping there was a tendency for the hand to deviate toward the radial

side. The circumference of the thighs at the top was 33.6 cm., and of the calves 21.5 cm. There was diminished sensation for touch and pain on the feet and legs to about the level of the knee, and a questionable tenderness of the large nerve trunks in the calves to firm pressure. The skin was rather cool and slightly cyanotic over the legs and feet. The knee-jerks and ankle-jerks were absent. The reactions of the pupils to light and distance were normal, as were the external ocular muscles, there being no nystagmus, or other abnormality. The speech was normal. The tibialis anticus, extensor communis digitorum, peronei, and gastrocnemius in both legs did not react to strong galvanic current, nor to strong faradism, except the gastrocnemius, which responded feebly to a strong faradic current. That is, the muscles affected showed diminished irritability to both currents, with no reaction of degeneration. The vastus externus and vastus internus responded normally to both currents. At an examination in March and when shown, the condition remained the same except that the sensation appeared perfectly normal for both touch and pain, the slight tenderness of the nerve trunks had disappeared, and the strength of the anterior leg muscles had increased so that the toes could be lifted from the floor slightly, but the gait did not seem improved, nor the deformity of the feet. The treatment had been by massage, and the parents had been very regular in bringing the child for treatment.

Is Childbearing a Cause of Mental Disease?—This was the title of a paper read by Dr. Cowles.

Dr. Mitchell said he had looked over the records of the Danvers Insane Hospital for a period of one year, ending September 30, 1905, to determine what cases of insanity among the women admitted during that time, could be considered as directly related to childbearing. Of the two hundred and twenty-eight cases admitted, seventy-eight were single. Of these, three imbeciles had borne one or more children, but in no way was their mental trouble due to this cause. Eighty-three were over forty-five years of age. Excepting a few cases of manic-depressive insanity, who had had one or more attacks in early life, there was no possible relation between the onset of psychosis in the cases of this group and the puerperium. These few cases showed typical symptoms of manic-depressive insanity, and as the last attacks had no time relation to childbearing, they are not considered because of the difficulty of obtaining reliable histories of an earlier period.

The remaining sixty-seven cases were widows or married women under forty-five years of age, and the essential facts are given in each case, where the onset of the psychosis was noted during pregnancy, or within a year after childbirth. Among those answering these conditions were six cases of dementia præcox. One of these women had had two children; the first labor was normal. During the early part of the second pregnancy she began to show mental symptoms and is now demented.

A second woman had one normal labor, and six months after the uneventful birth of a second child, showed mental symptoms terminating in dementia. The other four cases had a history of peculiarities, neurotic temperament, or free use of liquor, dating back indefinite periods, and from best history obtainable it was impossible to associate the onset of psychosis with childbirth.

There were also five cases of manic-depressive insanity. It was the first attack in two cases, occurring three and five months after pregnancy and with five and two previous children, respectively. Labor had been uneventful with both women, one of whom has left the hospital recovered, and the other is improving. Another woman had had five attacks, the first occurring before marriage, and the last beginning two months after an easy labor. This last attack presented same features as the first.

Another woman with three previous attacks, two of which were not connected with childbearing, developed symptoms similar to those in preceding attacks, three months after normal pregnancy. There was a history of insanity in several members of immediate family. The last case developed mental symptoms nine months after normal labor. She had had a similar previous attack while unmarried.

Of the four remaining women, one with four children was sent to the hospital eleven months after last labor. History stated that she had been "hysterical" all her life, but that for a week before admission she had appeared insane. Leaving the hospital in a short time, no diagnosis was made.

Another woman was sent to the hospital for use of drugs. Her youngest child was five weeks old, and she had used drugs excessively for over four years. The two remaining women were general paralytics, who had shown evidence of the disease before the birth of the last children.

In considering the causes of insanity in this series of cases covering admission during a year, it is difficult to trace sufficient relation between childbearing and the psychosis to warrant the statement that the former in itself is a frequent cause of mental disturbance.

Dr. Abbot said his personal opinion was that we really *know* very little about the causation of the different forms of insanity, but are apt to *assume* a great deal. In the cases that he had seen there has been not one cause alone, but many, though some one may be especially obvious or prominent. So the strain of childbearing, though physiological, may be one of many strains that act together to bring about an attack of insanity. There are now at the McLean Hospital four cases whose insanity came on immediately following childbirth. Of these one is a typical case of manic-depressive excitement in a woman who had a similar attack before marriage; one is a typical case of the psychomotor retardation of manic-depressive insanity without, however, any emotional depression; the other two are anomalous cases, but probably also manic-depressive insanity. He could not at this moment recall any one typical case of dementia præcox following childbirth, but his impression was strong that they had had them at McLean, and his experience confirmed that of Dr. Mitchell. Two or three months ago, in conversation with a general practitioner in active practice in one of the suburbs of Boston, Dr. Abbot asked him how many cases of puerperal insanity he had seen. He replied that he had just completed a series of 1,300 obstetric cases, and that in that number he had had only one or two cases. He was much surprised at the infrequency of so-called puerperal insanity.

Dr. Lane was surprised to hear the high percentage of puerperal cases (10%) quoted by Dr. Cowles. The figures for Great Britain, published a few years ago, was 6% to 7%, and in recent years in Massachusetts 4%.

A few years ago Dr. Lane studied the question statistically to ascertain how much effect the puerperal condition could have in causing mental disease. In the first place the United States Census finds that 70% of all insanity occurs between the ages of 20 and 50. In the city of Boston there are 280,000 females, and 135,000 between the ages of 20 and 50. Judging from the past, we have a right to expect 353 women would be committed to an insane hospital in one year of that number. In Boston not over 60% of commitments would be between the ages of 20 and 50, as a large proportion of senile cases are committed. Sixty per cent. of 353 is 212; then we may expect 212 women of the childbearing age to be committed in a year in Boston. The vital statistics tell us 18,000 living children will be born in a year. This takes no account of stillbirths or miscarriages. But if insanity overtakes the 18,000 mothers in the same ratio as it does women in general between ages 20 to 50, we should expect 28 cases of insanity. But curiously enough only 14 puer-

peral cases were committed in a year from Boston, so that as far as these figures go the puerperal condition would seem to be a guarantee against mental trouble. It certainly is not a serious cause. There are probably good reasons for this exemption. In his experience types of confusional insanity are the most numerous. Dementia præcox (or as he would prefer to call it, hebephrenia) comes next. Now that asepsis is practiced so generally, there is a decided falling off in the acute delirious cases following childbirth.

Dr. Knapp had found that by far the commonest type of mental disease, associated with the puerperal state, was that of acute hallucinatory confusion, which was probably of toxic-infectious origin. Of late years he had seen much fewer cases, and he could not help associating this decrease in the number of cases with the greater precautions against puerperal sepsis. Other forms of mental disease might also develop in the puerperal state, but such an occurrence was rare, and in many cases had no causal connection with the puerperium.

Dr. Courtney said the small percentage of so-called cases of childbirth, or puerperal, insanity is really surprising when we consider how many young women start out on their first pregnancy, their minds overwhelmed with superstitious dread of this contingency. With regard to infection as the etiologic factor in the puerperal form, he could not help feeling extremely sceptical. Infection may be the cause in a small group of cases. Dementia præcox has been spoken of as one of the types of puerperal insanity frequently observed. He could not regard this as more than a coincidence. He believed that in this group the insanity really precedes the pregnancy, and that mental enfeeblement, which is such a striking feature of the disease, makes the victim an easy prey for the seducer.

Dr. Brownrigg said that until recently all the cases of insanity associated with the puerperium or pregnancy that he had seen had evidently been recurrences of former morbid mental states, or influenced so indirectly by the physical condition that it could easily be explained by the operation of many causes of which the physiologic process under discussion formed only a part or lesser role. In all these cases, too, there had been some abnormality, some deviation from what is deemed a normal pregnancy or puerperium, such as renal complications or local infection. Recently, however, he had seen a few cases of undoubted insanity in pregnancies of robust individuals, which had led him to change his views a little. He cited one case of a lady of good heredity and mental stability, who had repeatedly had severe sickness without any mental complications; but that whenever she grew pregnant, decided melancholia supervened, and her mental depression became to her family the first sign of her pregnancy. While he did not think that pregnancy produced a type of insanity that could be considered distinctive *in form*, he did think that there was justification in Dr. Clouston's etiologic classification in so far as a normal pregnancy might be practically the sole factor in producing undoubted alienation.

Dr. Tuttle had no doubt that childbearing, and especially its accompanying accidents, are often a cause of insanity, like other things which cause anxiety, loss of sleep and exhaustion, but he doubted if they have more influence than other equally disturbing and exhausting circumstances.

There was to his mind no reason for saying that a special form of mental disease follows childbearing, because the cases which he had seen following, perhaps dependant upon, it do not differ from the ordinary forms of insanity due to other causes. Personally, he had seen more cases of manic-depressive insanity after childbearing than any other form; but this, of course, depends on the point of view, and others might have made a diagnosis of dementia præcox in some of his cases. His diagnosis:

of the depressed phase is made on depression of spirits, usually with affect, self-reproach and such delusions as may spring from a state of mental depression; a feeling of inadequacy or psycho-motor retardation, or both; a thinking disorder with loss of power of voluntary attention; of the excited phase on exhilaration or excitement; psycho-motor acceleration; distractibility, flight of ideas, confusion, and perhaps disorientation; and of the mixed phase on symptoms of both the excited and depressed phases, e. g., depression with flight of ideas, or distractibility with depression and retardation.

Some of these cases have had an attack after the birth of one child, and not after the others. In such instances there were other causes operating besides the childbearing. Again, the same patient has had attacks identical in form after other causes as well as after childbearing. A patient now in the McLean Hospital with her fourth attack had a first in 1892, following preparations to go as a missionary to a foreign country. This was an excitement followed by a depression. In 1893 she had a second attack of exhilaration of shorter duration without assignable cause. She was married in 1895 and gave birth to a child in 1896, and another in 1898 without mental trouble. In 1905 she had another attack of the excited phase of manic depressive insanity of three months' duration, again without assignable cause, except that she had been a little overactive in her social duties. There was a complete recovery after each of these attacks. In 1906 came another attack of manic-depressive insanity, practically a repetition of the one of the previous year, following the birth of her third child. This pregnancy, coming so soon after her attack of mental disease, was most unwelcome and caused her great anxiety, because she feared the child would be deaf and dumb or an idiot. Another patient had an attack of the mixed phase following a miscarriage seven months after marriage. She worried greatly lest people would think the child was begotten before marriage. She recovered in about a year, and has borne three children since then without mental trouble. His conclusion from such cases as these is that unless there is something especially exhausting about the childbearing, insanity during or after it is due rather to accompanying circumstances.

Something has been said about auto-intoxication in these cases. Dr. Tuttle was sceptical about this. He had so often seen the symptoms which are relied upon for this opinion apparently due entirely to exhaustion from insufficient food and lack of sleep, that he was quite sure they are due to this and not to any specific infection. The patient of whom he spoke came to the hospital in a perfect physical condition, but after a few days of abstinence from food, with great motor excitement and loss of sleep, she had a coated tongue, foul breath, sordes on teeth, rapid pulse, and a temperature of 101° , all of which disappeared in three days with tube-feeding.

Periscope

Psychiatrisch-Neurologische Wochenschrift

(Oct. 14, 1905.)

I. Castration in Certain Cases of Mental Disease. NÄCKE.

1. *Castration in Mental Disease*.—A plea for the legalizing of the sterilization of certain classes of the degenerate, idiots, imbeciles, criminals, etc. He recommends in the case of males the operation of vasectomy.

(Oct. 21, 1905.)

I. Women Nurses for the Male Insane. HOPPE.

1. *Women Nurses*.—A plea for the employment of women nurses in the male wards of hospitals for the insane with a short history of the movement and a review of some of the literature.

(Oct. 28, 1905.)

I. Trichophytosis and Other Results of the Continuous Bath. WÜRTH.

1. *Results of the Continuous Bath*.—The author calls attention to the possibility of infection with trichophyton tonsurans in the continuous bath. He also mentions other objections to its use. Among the accidents that result from its use are sudden lowering of blood pressure and collapse, while the more common troubles are maceration of the skin, which produces a tendency to decubitus in the aged and infirm, conjunctivitis from irritation of the eyes and constant rubbing by catatonics and idiots, increase of discharge in chronic otitis media, and disseminated infection in furunculosis.

(Nov. 4, 1905.)

I. The Case Treatment of Epilepsy.

1. *Treatment of Epilepsy*.—A short description of the Ceni method of treatment which has already been described in these pages.

(Nov. 11, 1905.)

I. Reform in the Care of the Insane in Rio de Janeiro. MOREIRA.

1. *Reform in the Care of the Insane*.—This article is a short description of a new institution for the care of the insane, illustrated by pictures of the different buildings and of interiors. It seems to be modern in every respect, comprising cottages for epileptics, infection and diseases, appliances for hydrotherapy, electrotherapy, mechanotherapy, with surgical, ophthalmological, dental, anthropometric, photographic pathological departments and a well equipped library.

(Nov. 18, 1905.)

I. The Development of Our Personal Care. FUHRMANN.

1. *Personal Care*.—The author thinks that personal influences and harmonious and pleasing surroundings more important than electricity, mechanotherapy dietetics, etc. This personal influence is best brought about by establishing a system of instruction and coming into contact with the patients in that way.

(Nov. 25, 1905.)

I. The Rhenish Provincial Asylum.

1. *The Rhenish Asylum*.—A description of the hospital, with illustrations and plans of buildings.

(Dec. 2, 1905.)

I. The Roots of Delusions in Everyday Life. LOMER.

1. *The Roots of Delusions*.—The author speaks of a "physiological paranoia" as the result of certain habits of thought which become fixed. He cites the case of the man who day after day occupies the same seat in a

tavern until he gets to think the seat belongs to him and flies into a passion if he finds someone else has taken it. Wholly pathological ideas grow up in this way and become fixed as motives for conduct. The firmer an association of this sort is formed in the environment the more powerfully does it influence conduct. These incorrect notions are most apt to be engrafted on the plastic mind of the youth who may be taught to receive things, uncritically, on faith.

(Dec. 9, 1905.)

1. The Observation Ward and the Continuous Bath in the Private Asylum. ERLÉNMEYER.

1. *Observation Ward*.—The author was of the opinion that the observation ward and the continuous bath having proved their usefulness and value in public hospitals for the insane should be introduced in the private ones. The two great objections were: First, the social objections, the patients or their relatives not desiring them to be associated with others; second, the feeling that they had come to a private institution for personal care and were therefore entitled to a single room. These objections had to be carefully and judiciously overcome in selected cases, but with such good results and such a marked diminution of the common accidents and disturbances arising as a result of isolation that two villas were built; one for men and one for women, having observation rooms and rooms for continuous baths adjoining. The patients also have single rooms, but are brought into the general dormitory when their condition demands it.

(Dec. 16, 1905.)

1 The Continuous Night Watch. STARLINGER, MAUER-OERLING.

1. *The Continuous Night Watch*.—A report on the results of a questionnaire addressed to general institutions for the insane on the character of their night service. Not of interest to American readers.

(Dec. 23, 1905.)

Contains only an article touching a judicial opinion. Optical interest only.

(Dec. 30, 1905.)

1. Clinics for Mental and Nervous Diseases. SOMMER.

1. *Clinics for Mental and Nervous Diseases*.—A concise statement of his aims at his clinic in Giessen, and a plea for the closer union of neurology and psychiatry.

(Jan. 6, 1906.)

1. The Significance of Psychiatry for Pedagogy. HERMANN.

1. *Psychiatry for Pedagogy*.—An article mainly dilating on the improved attitude towards the mentally defective wrought by psychiatry in explaining the symptoms of their condition from a scientific standpoint, and thus in the educational treatment of these cases guaranteeing for each justice and humanity.

(Jan. 13, 1906.)

1. Female Nurses for Male Patients. ENGELKEN, JR.

1. *Female Nurses for Male Patients*.—The author writes on this subject after having investigated the systems in vogue in the asylums in England and Scotland. The article in general is a plea for the use under proper conditions of female nurses in the care of male patients.

(Jan. 20, 1906.)

1. Graphic Representation of the Maniacal Symptom Complexes. BRESLER.

1. *Maniacal Symptom Complexes*.—The author believes that the depressive and maniacal stages of manic-depressive insanity are not absolutely opposed to one another, and that therefore in the graphic representation of a change from one stage to the other the curve should not cross the base line, thus indicating a return to the normal. He therefore indicates the depressive stages by an unbroken line and the maniacal stages by

a broken line, both of which he draws in curves above the base line representing the normal. He speaks of manic-depressive insanity as a simple periodic, depressive psychosis, with at times the occurrence of the manic-al symptom complex. The author believes that the portions of the cortex involved in manic-depressive insanity are the nerve cells described by Cajal, with short axis cylinders, which have no specific functions, for example, either at the beginning or the end of the projection system of fibers, but that they have a certain function in relation to these higher cells in regard to the direction and rapidity, etc., of movements. These cells, he thinks, present a different threshold value to irritants than the cells with long axis cylinders.

(Jan. 27, 1906.)

1. Occupation for Patients on Observation Wards. CHOTZEN.

1. *Occupation for Patients.*—The author believes that patients with mild degree of excitement and anxiety can be to advantage employed in light, simple work, and he has devised a form of work consisting of making up little fancy paper ornaments and binding them together in packages of one hundred each, which he believes is a great help to this class of patients. By keeping them occupied it makes the problem of watching them easier.

WHITE.

Revue de Psychiatrie et de Psychologie Experimentale

(May, 1906.)

1. Historic Critique of Dementia Præcox. PAUL JUQUELIER.

2. Musical Language and Its Disorders Among Hysterics. J. INGEGNIEROS.

3. Pseudo Suicide of a General Paralytic. A. DELMAS.

1. *Dementia Præcox.*—This article is entirely historic, comprising a review of the literature and various views that have been held regarding this disease. The writer sums up in a general way by saying that we know that we have certain psychopathic states, and that the appearance of a series of hebephrenic and catatonic symptoms are to be considered as very grave. These cases are characterized by a feebleness of voluntary attention, emotional indifference, psychic automatism, negativism or suggestibility and diminution of the mental images, stereotypy of attitudes, gestures and language. It is legitimate to give them the name of dementia præcox imposed by usage, and sufficiently representative in spite of the objections that have been raised, especially from the point of view of the prognosis.

2. *Musical Language and Its Disorders.*—The author, after a brief discussion of the psychology of music, in which he says that the human voice is a gesture and that music is vocal in origin, being an expression of the emotions characterizes the various hysterical diseases of the musical language as dysmusias, of which there are three varieties, amusia, which may be sensory or motor, hypermusia, including musical impulses with crises of musical composition, being the auto-suggestive product of a fixed idea, and the paramusias, including colored hearing, musical phobias, etc.

3. *Pseudo Suicide of a General Paralytic.*—This article is the report of a case of a general paralytic whose death was the result of syncope following the introduction of a handkerchief in his mouth. The patient was too demented to have had a consistent suicidal idea, and it was supposed that the handkerchief was placed in his mouth as the result of an automatic act, which accidentally resulted in his death.

WHITE.

Miscellany

SPINAL CORD DEGENERATIONS IN A CASE OF ACROMEGALY, WITH TUMOR OF THE PITUITARY REGION. By Albert M. Barrett, M. D. (The Amer. Jour. of the Med. Sciences, February, 1906).

The patient was sixty-six years old. The clinical features of the

acromegaly were: The enlargement of the bones of the face, the myxedematous skin, the thinness and absence of hair, the hoarse voice, and anomalies of the genitalia. She was for a time disoriented and confused, and at another time had a delusion of persecution. At necropsy there was found a tumor in the region of the pituitary body, which histological examination showed to be a sarcoma. There was present a non-systemic degeneration in the posterior columns of the cervical region of the spinal cord, most marked in the lower segments which resembled very closely those degenerations of the posterior columns seen in anemias and severe cachectic conditions. It was different from those degenerations of the posterior columns of the cord frequently met in brain tumor cases, in that it did not affect the posterior root entrance zone.

C. D. CAMP (Philadelphia).

PRIMARY CAVERNOUS SINUS THROMBOSIS, WITH INVOLVEMENT OF ALL OF THE CRANIAL NERVES OF ONE SIDE, EXCEPT THE AUDITORY, AND WITH PECULIAR MENSTRUAL DISTURBANCES. REPORT OF A CASE. By William Zentmayer, M. D., and T. H. Weisenburg, M. D. (The Amer. Jour. of the Med. Sciences, February, 1906).

A summary of the case as given by the authors: "A woman aged thirty-four years, with a decided nervous history, but with no history of disease beside those of early childhood, began to have slight exophthalmos and ptosis on the right side, probably before the eighth year. These ocular symptoms, with additional pain and inflammation of the right eye, heralded the approach of the first menstrual period. After this the exophthalmos and ptosis gradually became more marked, but at each menstruation these symptoms were more severe. Four years after marriage the ocular symptoms became more intense and persistent, and two months afterward it was found that she was pregnant. The ocular symptoms were the first signs of pregnancy. She gave birth to twins when it was noticed that the exophthalmos was more marked than ever before, and that there was ptosis of both eyelids. The ptosis of the left eye soon disappeared. Examination at present shows a marked exophthalmos and almost complete ptosis of the right eye, with marked venous congestion of the eyelid. There is a slight atrophy of the right optic nerve and a pallor of the left. Besides a complete internal and external ophthalmoplegia of the right eye, there is a total motor and sensory paralysis of the right fifth nerve, paresis of the right seventh, ninth, tenth, eleventh and twelfth nerves, and on the left side there is a partial paralysis of the third nerve; in other words, an involvement of all of the cranial nerves on the right side, with the exception of the eighth, and an involvement of the second and third nerves on the left side. The ocular symptoms became more acute at each menstruation." The symptoms are explained as due to a marasmic thrombosis of the cavernous sinus which extended back into the superior and inferior petrosal sinuses and caused pressure on the cranial nerves. The peculiar increase in the ocular symptoms at the menstrual periods may have been due to increased venous congestion at that time.

C. D. CAMP (Philadelphia).

OPERATIONS FOR THE RELIEF OF PELVIC DISEASES OF INSANE WOMEN. By LeRoy Brown (The Amer. Jour. of the Med. Sciences, February, 1906).

As a result of the pelvic examination of the patients admitted to the Manhattan State Hospital West it was found that 75% had some form of pelvic trouble. Operations have been done only to save life or to relieve physical suffering. Nearly half of the patients who were operated upon were markedly improved, and almost all were benefited. In no case was the patient's mental state made worse. Mental improvement has been hastened by the somatic improvement following operation in many of the cases. Surgical operations on insane patients are not surrounded with unusual difficulties.

C. D. CAMP (Philadelphia).

Book Reviews

LES AUTO-MUTILATEURS. ETUDE PSYCHO-PATHOLOGIQUE ET MÉDICO-LÉGALE. By Dr. Charles Blondel. Jules Rousset, Paris.

Self-mutilation has always been an interesting pathological manifestation. Singular and dramatic in its effects, complex and obscure in its causes, it is, says Blondel, at the same time rare enough to attract lively interest and frequent enough not to discourage scientific research.

In this small volume of 132 pages he has collected a mass of information bearing on a variety of forms. Voluntary castration; enucleation of the eyes; voluntary burning; direct and indirect forms of mutilation; mutilation to avoid military service, etc.

The reading of this collection impresses one more and more with the psychopathic character of these auto-mutilators and brings into strong relief the fundamental picture of dementia præcox in the Kaepelian sense, as an underlying mental state in the vast majority of these auto-mutilators. Alcoholism, senile dementia, general paresis, epilepsy, hysteria and manic-depressive insanity contribute to the number, but dementia præcox is perhaps the most widespread affection in these sufferers.

One of the most interesting series of observations is in relation to religious ecstasy and self-mutilation. Blondel's observations contribute another side light to the pathological nature of some forms of religious conduct.

The work is full of interest and is a useful summary of much modern literature. JELLIFFE.

LES DOCTRINES MÉDICALES. LEUR EVOLUTION. Par E. Boinet, Professeur de Clinique médicale, Agrégé des Faculté de Médecine. E. Flammarion, Paris.

In medicine, dogmas and doctrines have played a large and important rôle. Doctrines, being wider than theories, came to engulf them and develop into large and synthetic systems which may, in time, become the guiding directing principles of scientific and practical medicine. There are no practical medical systems, says Bouchard, without doctrines. Thus they come to constitute the steps on which medical science advances, and it is the author's task to discuss some of the more important of these progressions, tracing the doctrines which have contributed most to the evolution of medical science. Notwithstanding the number, the variety, the diversity, or the brevity of the reign of many medical doctrines, each in its time has contributed something to the edifice of the present or has enlarged the horizon of medical thought. Thus he traces the fundamental conceptions of the early Hippocratic schools and the Greek and Latin successors, following which there is presented a short chapter on the history of the compilation period of the middle ages and the part played by the Arabs in this time. The renaissance of the fifteenth and sixteenth centuries follows, in which the influences of the new anatomical and physiological studies are traced, with the philosophic doctrines of Bacon and Descartes, the physico-chemical ideas of the eighteenth century, and the newer vitalistic ideas of the Montpellier school. The rise of the cell doctrine is briefly reviewed and an excellent résumé given of the microbian doctrines and the Pasteurian era in medicine. Final chapters discuss epidemic diseases, the influence of the soil, auto-intoxication, heredity, modern humoral ideas and the application of modern ideas to therapeutics and hygiene.

In this little volume we see the very excellent presentation of that most necessary topic, a general view of the direction of medicine. It is well and interestingly done, and worthy of special praise. JELLIFFE.

CONTRIBUTORS TO VOL. 33

Allen, C. L.....	Trenton, N. J.	Mettler, W. H.....	Chicago, Ill.
Amberg, Emil.....	Detroit, Mich.	Mills, Charles K....	Philadelphia, Pa.
Angell, E. B.....	Rochester, N. Y.	Moffit, Herbert C.	San Francisco, Cal.
Blumer, G. Alder..	Providence, R. I.	Moleen, George A....	Denver, Col.
Bryant, W. Sohler.....	New York	Newmark, L.....	San Francisco, Cal.
Bullard, W. N.....	Boston, Mass.	Nichols, H. J.....	Washington
Buckley, A. C.....	Philadelphia, Pa.	Onuf, B.....	Sonyea, N. Y.
Burr, Charles W....	Philadelphia, Pa.	Patrick, Hugh T.....	Chicago, Ill.
Camp, C. D.....	Philadelphia, Pa.	Paton, Stewart.....	
Carey, H. W.....	Troy, N. Y.	Paul, W. E.....	Boston, Mass.
Church, Archibald.....	Chicago, Ill.	Prince, Morton.....	Boston, Mass.
Clark, J. E.....	New York	Putnam, J. J.....	Boston, Mass.
Collins, Joseph.....	New York	Russell, Colin K.....	Montreal
Cushing, Harvey....	Baltimore, Md.	Sachs, B.....	New York, N. Y.
Dana, Charles L.....	New York	Sailer, J.....	Philadelphia, Pa.
Dercum, F. X.....	Philadelphia, Pa.	Sinkler, Wharton...	Philadelphia, Pa.
Gordon, Alfred....	Philadelphia, Pa.	Southard, E. E.....	Boston, Mass.
Gordinier, Herman C....	Troy, N. Y.	Spiller, William G..	Philadelphia, Pa.
Groszmann, Waldemar H.....		Stedman, Henry R....	Boston, Mass.
Hall, J. N.....	Denver, Col.	Stockton, George....	Columbus, O.
Hoppe, Herman H....	Cincinnati, O.	Taylor, E. W.....	Boston, Mass.
Hopkins, S. D.....	Denver, Col.	Walton, G. L.....	Boston, Mass.
Jelliffe, Smith Ely.....	New York	Waterman, G. A.....	Boston, Mass.
Krauss, William C....	Buffalo, N. Y.	Weisenburg, T. H..	Philadelphia, Pa.
Martin, Collier F..	Philadelphia, Pa.	White, William A.....	Washington

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